

SCIENTIFIC NOTES ON AN EXPEDITION INTO THE NORTH-  
WESTERN REGIONS OF SOUTH AUSTRALIA.

[Read October 14, 1915.]

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(a) NARRATIVE.

By S. A. WHITE, M.B.O.U.

PLATES XLIV. TO LXIV.

Through the courtesy of Sir Richard Butler (the then Minister for Mines), I was granted permission to accompany an expedition to the little known north-western corner of South Australia. This expedition being under the leadership of Mr. R. Lockhart Jack, B.E., I went as a scientist, but in an unofficial capacity, and took as an assistant collector and taxidermist Mr. J. P. Rogers. The present notes deal mainly with the zoological and botanical objects noticed during the trip.

On June 17, 1914, the expedition left Adelaide by rail, reaching Oodnadatta, 700 miles to the north, three days later. We were delayed for a short time at the rail head owing to the non-arrival of our camel train, but the time was utilized in collecting around Oodnadatta. Amongst some rare birds collected were the "Grey Falcon" (*Falco hypoleucus*), "Black-banded Whiteface" (*Aphelocephala nigricincta*)—a record for furthest south for the latter.

Our party consisted of R. Lockhart Jack, B.E., F.G.S., leader; S. A. White, scientist attached unofficially; J. P. Rogers, S. A. White's privately-secured assistant and taxidermist; W. H. Williams and R. Nicholls, prospectors; J. L. Sullivan, camel man; and two aboriginals, Bob and Paddy. Our transport animals consisted of sixteen cow camels, mostly of a light stamp.

Our course after leaving Oodnadatta was a north-westerly one. During the first day we covered thirteen miles over gently undulating country, the plains being covered in saltbush (*Atriplex*), the bladder saltbush (*A. vesicaria*), and in some places old-man saltbush (*A. mummularia*). The gentle slopes and ridges have a fair quantity of "mulga" (*Acacia aneura*) growing upon them, and on some of the creek banks stinking acacia (*A. cambagei*) grew; but the latter was soon lost sight of, and was only seen once or twice afterwards. A few unimportant birds were collected the first day.

Next day was a red-letter one, for we obtained several specimens of the long-lost "Banded Whiteface" (*Xerophila pectoralis*). This bird was named from a single specimen by Gould in 1871. The type was taken near Port Augusta, but has long since been lost. The weather became threatening, thunder rolled all around us, so our leader went into camp near a creek, the banks of which were lined with gidya, or stinking acacia, about fourteen miles from our last camp.

Next day travelling was very unpleasant, for a few points of rain fell in the early morning which just wetted the surface of the ground, and man and beast carried a big wad of clay at every step. Cotton bush (*Kochia villosa*) was very conspicuous on this part of the journey. We passed the Murdarinna Waterhole on the Wooldridge at noon, and went into camp about 4.30, after travelling fourteen miles. The "Banded Whiteface" was again met with during the day.

Next day, July 1, a pair of the only lately described "Desert Bushchat" (*Ashbyia lovensis*) was taken, and at 4 p.m. we reached Todmorden Station, and were heartily welcomed by Mrs. Breaden (Mr. Breaden having passed us on his way to Oodnadatta). Leaving Todmorden late in the day we struck out in a westerly direction, following the dry sandy course of the Alberga River, and camped at 6 p.m. in thick mulga at seven miles. Weather quite hot in the daytime, but bitterly cold at night.

On the following day we met with the "White-browed Treecreeper" (*Climacteris erythroptis superciliosa*) for the first time. The mulga round this camp was much larger than

usual, owing to the country being flooded at times from the Alberga River.

An early start was made next morning, following the Alberga through a mulga country till we reached the junction of the Coongra Creek, which we followed till 4 p.m., when we camped in a dense mulga scrub. A good many botanical and bird specimens were collected during the day. One of our black boys, "Paddy," overtook us at this camp, having left Todmorden cattle station a little before sundown, and reached us with a mail before midnight, having covered the twenty-seven miles in less than five hours on foot.

After another cold night we packed up ready for a start, but the camels wandered during the night, and the boys did not bring them in till late. It was 11 a.m. before we made a start, and we did not stop till 6.45 p.m. at Lambinna Soak.

Leaving Lambinna we made up over the tableland country. The gibber plains do not seem so pronounced on the tablelands as north of Oodnadatta, still there were long stretches of country covered with small fragments of rock polished by the action of wind and sand and coloured brown by the effect of oxide of iron, on which the sun's rays shone so brightly that it pained one's eyes. Birds were very scarce here, and only a few specimens of the more common varieties were collected. The "Cinnamon Ground Bird" (*Samuela cinnamomea*) was met with at times. On reaching Yoolperlunna Creek we camped at a waterhole, and here we met with "Western Ground Cuckoo-Skrikes" (*Petropodocys maxima*). They came to the waterhole in the evening to drink. It was at this camp that the first specimen of a species of *Malurus* was secured, which came between *M. melanotus callainus* and *M. m. whitei*; it will be found under the former name in the list of birds.

After leaving here our course took us over rough stony tablelands. During the afternoon we emerged on to a very fine plain dotted over with clumps of mulga and low bushes of *Eremophila*, sp.; the latter was out in blossom, which attracted a good many "Singing Honey-eaters" (*Meliphaga sonora*). Another half-day's travelling took us off the stony tablelands, and we entered upon the best piece of country we had seen west of Todmorden; plenty of good fresh salt-bush, and the mulga looked healthy and green. Low hills showed up at some little distance on either side, upon which grew a quantity of mulga; the soil seemed deep, and of a red sandy nature. We reached Wantapella Swamp, which at the time of our visit was quite dry, and had been so for many years. It is a large depression about two miles long by a mile wide, and the surface was sunbaked and cracked; it

was more or less covered by large bushes, up to 8 or 10 feet high, of a prickly plant, *Chenopodium nitrareum*. This was the home of the "White-winged Wren" (*Hallornis cyanotus*), also that sweet songster, the "Redthroat" (*Pyrrholaemus brunneus*). This was the furthest west we met with the "Banded Whiteface." This is no doubt due to the change of country which takes place a short distance west of this spot. A small covey of "Australian Dotterel" (*Peltohyas australis*) was met with, and several "Australian Bustards" (*Austrotis australis*) were seen. Here, owing to a day's delay (for adjusting loads, etc.) a fair number of birds, insects, and botanical specimens were procured.

Leaving Wantapella Swamp and travelling in a north-westerly direction the Indulkana Range soon showed up, with the mount of the same name forming the termination at the eastern end. The country was fairly flat, of a red sandy nature, with open mulga and saltbush plains. We passed right under Mount Chandler and along the northern side of the range, going into camp just outside the gorge in which Indulkana Springs are situated, with the high rugged range overshadowing us. Just after reaching this range a new grass wren (*Diaphorillas*, sp.) was met with, and other birds were procured. We passed through much bluebush (*Kochia eriantha*) near the range.

Early next morning our leader, Williams, and the writer took two camels, with two 25-gall. casks on each animal, up a deep stony gorge, at the head of which the springs are situated. We filled the casks at the largest spring, round which a quantity of rushes was growing. The water was of fairly good quality. There were several other springs, but some of them were quite salt. After the casks were filled I walked to the top of the gorge and found that the water, after heavy rains, must rush down with great force amongst huge boulders from a small catchment on the top of the range. The native fig (*Ficus platypoda*) and Murray pine (*Callitris robusta*) were met with for the first time in this gorge. Leaving the Indulkana Range we took a little more westerly course across a saltbush plain, crossed the Indulkana Creek where the country began to change, granite beginning to make its appearance. Many cork trees (*Hakea lorea*) in full blossom were passed, and a fair amount of bluebush and cottonbush (*Kochia villosa*). Many tracks of kangaroos were seen, and wild dogs were numerous.

The following day we passed over fairly level country, thick mulga, a little grass but no bush, crossed several stony ridges, mostly covered with broad-leafed mulga (*Acacia kempeana*) and a few "cork trees." Saw for the first time

large yards made of brush that were game-traps constructed by the natives, and were in some instances of great extent. At seven miles met with huge granite outcrops in the shape of boulders piled one upon the other, amongst which the native fig was growing. The eastern side of this granite outcrop was followed, and here was procured the "Pied Honey-eater" (*Certhionyx variegatus*) for the first time. Our camp at the end of the range was situated under a big mass of granite boulders amidst a thicket of bright flowering wattle trees (*Acacia doratoxylon*), the flowers and leaves of which yielded a good many small insects, and some land shells were found amongst the *debris* at the foot of the fig trees. A great many rock wallabies came out at sundown on the western side to bask on the rocks heated by the afternoon sun. Amongst the granite boulders grew a beautiful shrub covered in a wealth of glorious blossoms, some of the bunches of which were 8 to 10 inches in length, of a light-cream colour outside and dark-brown centre. Various travellers and explorers seem to have identified this plant as *Tecoma australis*, but Mr. Black correctly thinks that this is a mistake, for the flowers and bunches are much larger than those of that species; and if it were *T. australis*, growing in such a dry country, it should be much smaller. Although it is often stated that the natives procure their spear-shafts from this plant, I never once (although hundreds of shrubs were examined) saw a stem straight or long enough for that purpose. It may be the plant throws up long shoots during good seasons. This shrub was never found upon the plains or level country, but grew amongst the rocks, from 10 to 15 feet tall, showing no signs of a creeping habit. It is gorgeous when in full flower, and the time of our visit seemed its flowering season, for hardly a plant was observed that was not covered with great bunches of flowers, and the ground beneath was strewn with quaint boat-shaped seed-cases of the previous season. Mr. Black places it as *Tecoma oxleyi*. Our course now lay north of west, and our caravan was soon swallowed up in a dense mulga scrub. Kangaroo tracks were very numerous, but the animals themselves were seldom seen. Reached a rough and rugged range at 4 p.m., and when on top sighted the Musgrave Ranges at sixty miles. The country now gradually sloped to the west, and from three to four miles we passed through saltbush and bluebush, with a little mulga, then big mulga appeared, with a great quantity of old dry grass amongst it. A bitterly cold wind blew from the east all day, but died away at sundown, and set in for a freezing night. Birds were very scarce in this country, still sufficient were obtained to keep us busy each evening.

Next morning found everything frozen hard. We were soon packed up, camels loaded, and on the move again, passing through thick mulga and dry grass; later more open mulga, with ironstone ridges, on which grew a quantity of bluebush. On the flats native willow (*Acacia salicina*) and a few cork trees grew. Passing over claypans and on to rising ground, which was covered in a mass of *Eremophila gilesii*, we camped in a dense mass of mulga.

When the boys came in with the camels next morning they reported having seen "big smoke" on the rocky range to the east, and added "Blackfellow bin makim fire." Passing on through dense mulga growing on reddish sandy loam, a good many bustards were seen where open patches occurred, but these fine birds were very wild. Smoke was seen rising from isolated masses of granite away to the north. At 2.25 p.m. our boys became very excited upon discovering the tracks of wild natives, and it was very noticeable that the boys did not talk to one another nearly as much as usual, and were keeping a sharp look-out all round them. Passed over undulating sandy country covered in mulga, and here and there a native willow. Reaching the top of the last sandhill, the Musgrave Ranges loomed up in all their grandeur, partly enveloped in blue mists. Huge masses of granite rose to the north of us on comparatively level ground. Emerging from mulga scrub on to open loose sandy country, came upon a fine rockhole containing several hundreds of gallons of water. Moving on a little distance from the water we camped, and spent a very cold night; everything frozen by the morning. Bird life was very scarce, also insects, but a number of botanical specimens were taken, amongst which was a new *Toranthus* which Mr. Black has described as *T. whitei*, a most striking little plant with bright yellow flowers.

Leaving here we passed through large and dense mulga growing on low sandhills, then over hard red sandy loam, covered in dense mulga, all the lower branches of which were dead, and only the very top showing signs of life: everything in a very dry state, so that it crumbled away on being touched. Here there were numerous holes, excavated up to 4 feet deep, under the mulga trees, these having been made by the natives digging for the "Sugar Ant" (*Melophorus inflatus*). These insects are greatly relished by the natives, who pick up the insect with thumb and forefinger, placing the inflated abdomen in the mouth, which is bitten off, and the remainder of the insect's body is thrown away. Judging by the number of these holes the much-sought-after insect must be very numerous all over this country, and are called "woma" by the Everard natives. Coming out upon a large

open plain we found it covered with a thick mass of porcupine grass (*Triodia*); it was so thick that we had difficulty in getting the camels to face it. After about five miles of this prickly plant we entered the densest mulga we had yet attempted to penetrate; it was a difficult matter to find a place clear enough to camp upon. The night was bitterly cold, and everything was frozen hard. Birds were very scarce. A few blue grey-backed *Acanthizas* were the only ones found in the desolate scrubs, and this *Acanthiza* I have described as *A. marianae*. At this camping place another new bird was procured in the "Musgrave Flyeater" (*Ethelornis culicivorus musgravi*).

Next day we wound our way amongst the foothills of the Musgrave Ranges, with the main range looming up to the north of us. It was most disappointing country, dry and dismal, hardly any animal life to be seen or heard till our camels climbed over a saddle in an outlying range and we descended into Glen Ferdinand. As soon as we crossed this ridge we found a great change in Nature's face; a wide valley swept down between two high ranges, the surface of the soil was covered with yellow and white blossoms of everlasting (*Myriocephalus stuartii*), which were 8 to 10 inches high, in spite of the dryness of the sandy soil. Down the centre of the glen a creek found its way marked by fine red-gums (*Eucalyptus rostrata*). Bird life became at once more plentiful, and a bird was secured which appeared to be the "Grey-headed Honey-eater" (*Lichenostomus kertlandi*), but later found it was a much brighter-plumaged species, especially on the throat, where the yellow was much brighter; the ear-coverts were also much darker. Many botanical specimens were taken, and we went into camp a few miles up the glen. The tracks and signs of natives were seen about, but they may have been of some time standing. Our boys would insist that "wild blackfellow a little bit close up." Subsequent events showed this was not the case, and only illustrates how unreliable in such matters the partly-civilized native is.

As we proceeded north, up the glen, it gradually became narrower; at first great masses of boulders, piled one upon the other, were dotted about like islands, and to add to their beauty many pines (*Callitris robusta*) filled up the spaces between the boulders, their thick bluish-green foliage forming a strong contrast to the red granite. At one place some pine pollen, carried on a gentle breeze, bore a deceptive resemblance to smoke. The glen became narrower as we went on till there was hardly room for the camels to find their way between the ranges on either side of the creek, till at last they had to take to the bed of the creek itself, which was

thickly lined with ti-tree (*Melaleuca glomerata*). Mount Ferdinand, 4,000 feet, towered above us. A great mass of old-man saltbush surrounded the tree marked by Ernest Giles, the explorer, in 1873; the "E. G." was plainly seen, but, unfortunately, the blaze on the tree faced south, and it was almost impossible to get a good photo. One of our greatest disappointments came to us here, for the waterhole marked "Ernabella" on the map, and which Giles said was permanent, and which Hübbe stated "would float a ship," was quite dry, and had been for years. There was a gumtree, five years old at least, growing in the hole which once contained water.

The party now broke up—two went in search of Harris Spring, which was found to be dry; our leader (Mr. Jack) and myself searched to the north without success.

Next day we followed down Tietkens Creek and dug out many soakages and native wells without finding any water. We now traversed a dense mulga scrub, and after another day reached the rockhole, the last water which we had left some time previously.

The following day after our arrival on this water our leader, with Mr. Rogers and a black boy, with three camels started off for the south side of the Musgrave Ranges. This enabled me to do some collecting amongst the birds, and numerous plants and insects were obtained; also some interesting photographs were taken of ants' nests, native shelters, and plants. While sitting at the rockhole late at night, out of the darkness came the unmistakable call of parrots; hopes were entertained that they were the "Night Parrot" (*Geopsittacus occidentalis*). After flying round once or twice (they could not be seen, only heard) it was noted by the starlight reflecting in the water that they had settled on the edge of the rock. A shot was fired and one bird secured, which proved to be the "Blue-vented Parrot" (*Neopsephotus bourkii*). It is probable that these birds come in after dark to avoid the hawks, which are always waiting round the waterholes for small birds to come in to drink.

Trouble in getting water compelled us to fall back on Moorilyanna Native Well, but there might have been another water no great distance off, for although birds were very scarce, a fine bronze-winged pigeon (*Phaps chalcoptera*) was seen, and these birds are never found very far from water. A large flock of "White-browed Wood Swallows" (*Campbellornis superciliosus*) passed over the camp travelling south. A little to the north-east of our camp, in a slight depression, was found a small clump of gum-like wattles (*Eucalyptus oleos*), with very rough reddish bark a long way up the trunk



and main stems. Several specimens of the southern "Yellow-fronted Honey-eater" (*Lichenostomus plumulus ethelae*) were found amongst these trees. Going slowly back through the thick mulga, a small party of Blue-vented Parrots was flushed from the dry grass; the birds were very shy, and only one was obtained, the others flew like arrows away for miles.

At last we reached the native well, and collected there for a few days. Upon Mr. Jack's return he reported seeing a small pigeon, which, from his description, appeared to have been the "White-bellied Plumed Pigeon" (*Lophophaps plumifera leucogaster*). A few wallaby skins were added to the collection. Some strange and interesting native paintings were seen and photographed, as well as a small cave which had been used for ceremonial purposes. It was decorated with paintings inside, and around the entrance numerous fires had been lit. Down the ledge of rock, in front, a mass of dried blood was adhering, which had every appearance of being human, and our boys said it was so.

We left this fine well on a south-westerly course towards the Everard Range, which could be seen in the dim distance. The first day we passed through a mulga and grass country, with rocky outcrops occurring very frequently. This class of country was decidedly poor and dry; very little was collected, and we camped amongst a vast mass of dead mulga.

Next day passed through dead mulga, and at 3 p.m. entered in between two high ridges; a large fire was seen out on the low country, showing we had entered upon the natives' district, and that there was water in the locality. Our leader took Williams and Bob, with two camels, and struck out north-westerly to examine a soak and rockhole in the heart of the ranges. Mr. Jack and party, in returning, struck our tracks and reached camp after dark, stating they had found a rockhole containing about 100 gallons of water, and from tracks they had seen they were sure that a native with his wife and one child were camped near the water, but hearing the white party approaching had made off. Mr. Rogers reported having found a freshly-built bower birds' playground in a deep gorge not far from our camp.

Next morning we paid it a visit and saw a beautiful male "MacDonnell Yellow-spotted Bower Bird" (*Chlamydera maculata macdonnelli*). Photographs were taken of the bower, which was neatly constructed beneath a native figtree, with a large heap of bleached snail-shells and a smaller one of green *solanum* berries outside the entrance. We passed great masses of rounded granite, quite destitute of vegetation, but in the cracks and gullies wild figs and other shrubs grew. On the southern aspect of some of these masses of

granite quite a quantity of beautiful *Hibbertia glaberrima* grew, making a golden sheen with their bright-yellow flowers, and the pink flowers of *Ruelingia myniflora* were also very striking. Native tracks were very numerous, and only a few hours old in some instances, and although we had not seen any of the dusky inhabitants, there was not the slightest doubt we were being watched from the rocky heights.

Passing in between the main range we entered a very fine valley, 1,000 yards across at the entrance, with fine bold granite rocks on either side. Saw a pair of Crow-Shrikes, but in spite of all our efforts we failed to secure either of them. The valley we passed up was a lovely one, even after such a prolonged drought, and in a good season it must be very beautiful. A good many botanical specimens were collected before we camped at no great distance from Mount Illbillie (3,000 feet) amongst some fair-sized redgums.

Next morning we all went up to the rockholes to assist in watering the camels. There was a series of them, round holes worn out of the granite, and in times of rain the water ran from one to the other. We bailed from one hole into the other, and from the lowest one into the tarpaulin at the foot of the rock, which was situated in a narrow passage with high rocks on all sides and a narrow entrance. Many photographs were taken and birds obtained. Amongst the latter were honey-eaters resembling Keartland's bird, "Buff-throated Grass Wren" (*Diaphorittas textilis purnelli*), which were most difficult to secure, as they seldom took to the wing, but passed from one bunch of porcupine grass to another like mice, their mottled rufous colour harmonizing so well with the red granite that it was most difficult to pick them out. Here there were some fine blood-wood trees (*Eucalyptus terminalis*) bearing fruit of exceptionally large size.

We passed out of these ranges to the west, and were just approaching a narrow neck where the ranges on either side converged towards each other, when we heard loud "yacking" calls, which greatly resembled those of a species of baboon found in Africa. Our boys answered the call, and in a very short time we saw a party of six natives running after us. They were armed with three or four single-barb spears each, a spear-thrower which they called "Mooro," a yam-stick, "Wanna"; also a food and water bowl, "Wera." They were finely-developed men, well nourished and developed, stood 5 feet 10 inches or over in height, and in almost a nude condition, for all that was upon their bodies was a thin twisted hair-cord round the waist, and eagle-down (either white or coloured with red ochre) attached to the pubic hairs, but in no way sufficiently, or is it intended, to cover the

person. Their chests and arms were covered with red ochre, and a line of white down, attached by means of human blood, formed a half-circle, extending from one arm-pit to the other. The hair was tied back, in some cases forming a long chignon, and decorated with hawk's feathers (*Ieracidea berigora*). Two of these men carried fire-sticks, which they waved to keep alight. They held a round green object between their lips, which at first sight appeared to be a green *Solanum* fruit, but afterwards was found to be a ball of native tobacco (a new variety named by Mr. Black *Nicotiana suaveolens excel-sior*), which stained their lips a yellowish-green colour; in fact, one or two of these natives had the liquid running down the corners of their mouths and over their lips, giving them a decidedly savage appearance. After taking some photographs and giving these natives some presents, we moved on, with them in close attendance. As soon as we got outside the neck they began firing the porcupine grass, and, upon making enquiry, signified by signs that they were letting their people know in which direction we were travelling.

We were following a fair-sized creek, sometimes along the dry sandy bed and at others through great masses of porcupine grass (commonly but erroneously called spinifex). This has proved to be a new species, and will be found in Mr. Black's paper under *Triodia aristata*. Redgums lined the dry watercourses, but not one was of any great size. This class of country continued till we got clear of the main ranges, when we left the creek and struck out over level country covered by mulga, with high rugged detached hills, on which grew porcupine grass. During the afternoon our course was through similar country, in which innumerable holes showed where the natives had been digging out the sugar-ants. When these holes were pointed out to the natives, who were in close attendance, they would nod their heads and say "Woma," meaning sugar-ant. While out collecting during the day I was followed all the time by several natives, all in single file, who placed their feet in my footprints, and thus avoided the prickly-burrs which strewed the sandy soil, as my boots had the effect of pressing the sharp thorny seeds deeply into the sand. The natives drew my attention to any object of interest by a "hm, hm," sounded through the nose, and on looking round the nearest native pointed to a high point in the range and said "Carmeena" (the name of the mountain), and pointing downwards, meaning at the foot, repeatedly said "Carmen," meaning tobacco, which was growing at the foot of the range. Another time he pointed to a rounded hill and said "Punderanna coppe," the last word meaning water. At other times they pointed to a dog's tracks

in the sand, with the "hm, hm" again, adding "papa," meaning wild dog. In one case, when they wished it understood that the dog in question had pups, and their meaning was not at once grasped, one native went down on all fours, and tugging first at one nipple, then at the other, to show that it was a she-dog suckling young. Towards evening some of the natives became very excited, calling "Teeta," "Teeta," "Coppe," and going in the direction they indicated, through a dense mulga scrub, a high turtle-backed hill (like the half of a huge granite boulder thrust up through the sandy soil) was reached. The natives made for the steep side of the granite rock, and with their bare feet soon climbed 12 or 15 feet up, and throwing themselves down upon the rock were soon drinking from a rockhole, several feet deep, fed by the sloping sides of the great granite mass.

Next morning I paid a visit to the natives' camp. They were a splendid lot of fellows, good tempered, civil, and without a doubt very well disposed towards the white man. Some photographs were taken, and many little presents bestowed, before they left to go back to their own district, which seemed to be the north side of the Everard Range. One man only went on with us; he was a really fine specimen, about 40 or 45 years of age, some 6 feet in height, broad-shouldered and well nourished, good tempered, and always anxious to explain any matters of interest, and I could not move anywhere without being followed by him. His quick eyes could pick out a bird, mammal, or insect long before mine. To see his lithe, nude body passing noiselessly through the scrub, every muscle working to perfection, was an interesting sight, especially when in the attitude of stalking game.

Making a start from "Teeta" rockhole we took a westerly course between two high and rugged granite ranges, and before long were making the best way we could through very dense mulga. After rains great quantities of some plants, bearing edible seeds, must be prevalent through this country, for large grinding-stones belonging to the natives were seen in many places; so large, indeed, that they must have given considerable trouble to carry. We walked for hours through the dense mulga and never saw a living thing. At 5 p.m. we emerged from the mulga country into a sandhill country, with thick mulga on the flats, some of the trees being of fair size. Bird life, and indeed all other kinds of life, were very scarce in this region. *Cinclosoma castanotum dundasi* was met with for the first time, and seems only to be found in the sandhill country. Continuing on our westerly course the sandhills became more pronounced, and were covered with thick scrub in places. A beautiful little heath-like shrub,

*Thryptomane maisonneuoii*, covered with small flowers (dark-red and white), made its appearance. There are three species of mulga (*Acacia*) growing on this sandy ground, but unfortunately the state of the country was so very dry that few of these interesting shrubs were in flower. When crossing a higher sand-ridge than usual, a dark line showed up in the distance crossing our course from north to south, and our field-glasses showed it to be a bank of redgums, a feature that always marks one of the watercourses in that country, and this one could be none other than the Officer Creek, which has its source in the Musgrave Ranges, and winding out into the sandhill country loses itself amidst the dry sandy plains to the south. The sandhills took us right up to the Officer Creek, but the country improved somewhat before reaching its dry bed, and quite a crop of everlastings (*Myrecephalus stuartii*) lined the banks. Our camels were continually breaking their nose-lines as they made frantic attempts to get a mouthful of them as they passed along. Our leader followed the dry watercourse towards the Musgrave Ranges. The banks of this river only average 5 or 6 feet in height, and the absence of logs or large deposits of *debris*, as well as the very fine sand in the bed, would lead one to suppose that during flood-time there would not be any fast-running stream such as there is at the same distance from the MacDonnell Ranges, this being due no doubt to the level nature of the country through which the Officer runs. The first night we spent on this course was near a native well in the bed of the river; the sand had been thrown out for several feet, but there was no water in it. After the camels had been unloaded our leader, with other members of the party, put the well down much deeper, when a little water was obtained, but not sufficient to water the camels. Birds were much more numerous along this watercourse, and during our journey along it quite a number were secured. Many indications were seen of natives having visited this locality. On the day we left the Officer Creek to go east the wild native from the Everards pointed along the ground, east and west, where the camel-pad made by the Elder Exploring Expedition, twenty or more years previously, could be plainly seen. The country was in a very dry state, and not a drop of water existed anywhere.

We had now reached our furthest west, and the sun went down at our backs that night for the first time on our homeward track. Our course took us over low sandhills and through thick mulga scrub till we sighted some isolated masses of granite, which indicated that we were approaching the Everard Range again. Following a long outlier from the range we tried to get through a gap with the camels, but

failed. A northerly course was then taken, and we camped on the most north-westerly corner of the Everard Range. This camp is very fresh in the memory, for it is a most picturesque spot, situated on sloping ground, with a great mass of red granite as a background on the south and east; but away to the north and west the view was most extended, in which direction we looked over a sea of sombre-coloured mulga scrub, with granite outcrops in the forms of great red boulders here and there in the foreground. Away to the north and west the fine Musgrave Ranges loomed up on the skyline in a mass of purple mist. After finding an opening through the range we travelled south amidst most picturesque scenery till we reached the turtle-backed rock of "Teeta" rockhole. Being anxious to work this locality, and also spend some little time with the natives learning something about their customs, it was agreed that I should remain on the waterhole for a few days, then move on to Carmeena rockhole to meet Mr. Jack.

The days spent rambling through the ranges with my native companion were very interesting on account of the grand scenery, the solitude, and the expectation each day of finding something new. Enough also had been learned of the natives' ways and language to understand my aboriginal companion fairly well. He took me to ceremonial grounds and explained many of their ceremonies, as well as plants, insects, birds, and many other things, till the time came to move on to Mount Carmeena. The native now took the lead, and passed down a wide valley or plain thickly covered in mulga between granite ranges. I wanted to push on to where the map showed the waterhole, but the native insisted that I was passing the water, and said most emphatically "Carmeena Coppe," and proceeded to a fine series of rockholes. Just at the foot of the rockholes a great mass of giant tobacco grew. Some of these bushes were from 5 to 6 feet high, and all out in a mass of white flowers. Mr. Black has described this plant as a new variety of *Nicotiana suaveolens*. Typical specimens of *N. suaveolens* were taken within a short distance of the giant variety, which not only has a different growth, but the leaves are of a different texture. Near these rockholes there were some very fine bushes of *Acacia strongylophylla* which were in full flower. Over low bushes and down rocks a creeper with scarlet berries, *Melothria maderaspatana*, made a beautiful show. On one side a great mass of native figs (some trees of very large size) made quite a pretty arbour, amidst which camp was made. The native now set about fulfilling a promise to collect as many of his countrymen and women as possible, and straight away sent up smoke signals.

It was not very long before about thirty men put in an appearance in answer to the smoke message. He was very proud to be able to introduce me to his people, and lined them up to be photographed. There were some men well up in years, but not very old men; men in their prime down to children eight or ten years of age. All these natives were well grown and nourished; some were exceptionally tall, many being 6 feet or over in height.

The next day I went out hunting with a party of the natives, which seemed to please them very much, and obtained their confidence to that extent that they sent for some of their women folk, and the following day, under escort of three of the elders of the tribe, was permitted to pay a visit to the women's camp. There were sixteen women of varying ages and a few small girls. The women were from the ages of eighteen or twenty to forty-five or fifty, but no aged ones. Some photographs were taken and presents made, the children much enjoying the sweets given them. The women, like the men, wore no clothing, and there were several children in arms—all females with the exception of one. All those women who had no children carried a live wild dog round their waist. Several evening entertainments or corroborees were given by these natives, some of which were of a very weird nature. The stay at the foot of Mount Carmeena was all too short; still the country for many miles round was well worked, yielding much in bird and botanical specimens. For the first time specimens of the Crow-Shrike were obtained here; the bird is a large one, with a very strong bill. From all appearances it comes between the western form, *Neostrepera versicolor plumbea*, and the Eyre Peninsula one, *N. v. intermedia*.

Our party being re-united we travelled east, between great parallel masses of granite; the plain between was covered (in some places very thickly) with mulga, and here and there a few cork trees. In places redgums appeared marking the short course of a creek as it came out of the ranges. We were escorted by a number of the natives. The remainder, with their women folk, had gone off in another direction. We at last left the ranges and plunged into dense scrub. While amongst the ranges the mulga was fresh and healthy, there were many green bushes amongst the rocks, and many comparatively open spaces; but as soon as we left the ranges the mulga became very dense—a great part of it was dead, and that which still lived only showed life at the extreme top. All the natives, with the exception of three, departed when we left the ranges behind, and these were sent back after two days. It was quite sad saying good-bye to the last of these simple-minded people who had been so very friendly and well

disposed towards us, especially the old man who had followed me over so many miles of country and given so much information.

The weather had been changing for the last few days, and summer began to make itself felt, the heat being distressing in the dense scrub. Passing over sandy country covered in thick mulga, we at last sighted Schneider Hill, when our course was changed somewhat, and we passed through a very dense scrub, where little or no bird life was to be found. Very soon Chambers Bluff, in the Indulkana Range, came in sight, and Mount Johns could be seen in the blue mists to the south-east. We still struggled on through dense, dead, and leafless mulga till we crossed the Ammaroodina Creek, when the country became more open. As soon as we reached the tableland country the birds became more numerous; it was not long before *Aphelocephala pectoralis* and *A. nigricincta*, also *Calamanthus campestris isabellinus* were met with, as well as many more common species. One night at 9 p.m. we went into camp at Wantapella Swamp.

Leaving there we took a northerly course till we struck the Indulkana Creek. All this country was in a very dry condition; vegetation consisted of stunted mulga, needle bush (*Hakea*), cork trees, and *Grevillea*.

For the first day or two we followed the dry sandy bed of the Indulkana Creek, then our course took us away from it at times to strike it again at a bend. Bird life—in fact, all animal life—was very scarce through this country. Passing to the north of Mount Mystery and following the Alberga at a distance we reached the Lambinna Native Well. We travelled along very quickly now, which gave little time for collecting, yet we were successful in securing a few specimens each day. We were most kindly received at Todmorden cattle station by Mr. and Mrs. Breaden.

I left next morning at daylight with Mr. Breaden to drive into Ocdnadatta, reaching the head of the railway line the same day, arriving home on September 3.

Taking into consideration the great dryness of the country (a fall of rain not having taken place for at least nine years), and the fact that bird or other life is never numerous at the best of times, my work was very successful. I have the honour to be the first to make an ornithological reconnaissance of the Far North-west of South Australia. The expedition yielded ninety-four species of birds, of which five are new.

In spite of the dryness of the country I was able to collect nearly 200 species of plants, which have been dealt with by Mr. J. M. Black, who has described many new to science.



Owing to the prolonged drought mammals were scarce; those collected have been dealt with by Mr. Edgar R. Waite.

Reptiles were not nearly so numerous as on our expedition of the previous year; the selection secured this time has been worked out by Messrs. Waite and Zietz.

The work in connection with the insects has been undertaken by Mr. Arthur M. Lea and others. In this branch there is much new to science. Out of thirty species of ants collected, something like twenty are new species or sub-species.

There are also many new spiders in the collection, which have been worked up by Mr. W. J. Ranibow, of Sydney, some of which are of special interest.

To all the above-mentioned gentlemen my sincere thanks are due for adding to the value of this work.

In conclusion, my thanks are tendered to the leader of the expedition (Mr. Jack) for many kindnesses shown and assistances rendered during a very arduous journey through an almost waterless region. I pay a very strong tribute to my assistant (Mr. J. P. Rogers) for the great interest he took in the work and for his loyalty under very trying circumstances occasioned by the great drought.

The whole of the collection, with the exception of the birds, has been donated to the South Australian Museum.

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#### DESCRIPTION OF PLATES.

##### PLATE XLIV.

Map (facing page 707) of South Australia showing area collected over by S. A. White.

##### PLATE XLV.

Map (facing page 707) showing route traversed with the Geological Survey Expedition.

[The following plates are from photographs taken by S. A. White.]

##### PLATE XLVI.

Fig. 1.—Glen Ferdinand, Musgrave Ranges, looking southwest.

Fig. 2.—Undulating sandy plain, with the Musgrave Ranges in the distance—Mount Ferdinand the highest peak.

##### PLATE XLVII.

Fig. 1.—Glen Ferdinand, with creek and the Pinnacles (Musgrave Ranges) in the distance.

Fig. 2.—A ridge in the Musgrave Ranges covered with *Triodia aristata*—the home of the Buff-throated Grass-Wren.

##### PLATE XLVIII.

Fig. 1.—View in the Everard Range, near its centre, looking east.

Fig. 2.—View of the Divide near the head of the main valley of the Everard, near Mount Illbillie, looking west.

## PLATE XLIX.

Fig. 1.—Main Valley of the Everard Range (as in fig. 2, pl. xlviii.), but looking east.

Fig. 2.—Carmeena rock-holes, at the foot of Mount Carmeena. Carmen is the native word for tobacco, and the locality takes its name from a patch of the native tobacco plant which is seen in the foreground.

## PLATE L.

Fig. 1.—Near view of one of the rock-holes shown in the preceding (pl. xlix., fig. 2).

Fig. 2.—Watering camels at a rock-hole in an isolated granite boss, Everard Range.

## PLATE LI.

Fig. 1.—Watering camels at rock-holes, near Mount Illbillie, Everard Range.

Fig. 2.—Nearer view of rock-holes seen in fig. 1.

## PLATE LII.

Fig. 1.—Centre rock-hole in the series of rock-holes as above in fig. 1, pl. li.

Fig. 2.—A group of aboriginals in the Everard Range.

## PLATE LIII.

Fig. 1.—Aboriginals signalling from the summit of granite boss shown in fig. 2, pl. l.

Fig. 2.—Aboriginals of the Everard Range decorated with down of the eagle.

## PLATE LIV.

Fig. 1.—A group of aboriginals in camp, Everard Range.

Fig. 2.—An aboriginal who voluntarily accompanied the Expedition through the Everard Range.

## PLATE LV.

Fig. 1.—An aboriginal of the Everard Range throwing a spear.

Fig. 2.—An aboriginal using the *mira* in throwing a spear.

## PLATE LVI.

Fig. 1.—A young man of the Everard Range tribe.

Fig. 2.—An aboriginal with head-dress decorated with hawks' feathers, Everard Range.

## PLATE LVII.

Fig. 1.—Aboriginal boy of the Everard with reed penetrating the septum of the nose, this being the first stage in the rites of initiation.

Fig. 2.—A group of aboriginal women of the Everard Range, showing the strange practice of nursing the dingo.

## PLATE LVIII.

Fig. 1.—Middle-aged woman of the Everard Range tribe.

Fig. 2.—Middle-aged woman of the Everard Range tribe. At the side a mother is seen giving her child the breast.

## PLATE LIX.

Fig. 1.—Young mother nursing her first child.

Fig. 2.—Young mother with baby.

## PLATE LX.

Fig. 1.—Little girl of Everard Range tribe.

Fig. 2.—A cave in the granite used as an aboriginal rock-shelter, Everard Range.

## PLATE LXI.

Fig. 1.—Natives' shelter in the mulga scrub, Musgrave Ranges.

Fig. 2.—Native paintings on granite rock at Moorilyanna Soak.

## PLATE LXII.

Fig. 1.—A ceremonial cave containing native drawings, and the entrance covered with dried layers of human blood.

Fig. 2.—The cork tree (*Hakea lorea*).

## PLATE LXIII.

Fig. 1.—The native fig (*Ficus platypoda*).

Fig. 2.—The native tobacco tree (*Nicotiana suaveolens*).

## PLATE LXIV.

Fig. 1.—A group of *Senecio magnificas*, growing near Car-meena rock-hole, Everard Range.

## (b) THE ABORIGINES OF THE EVERARD RANGE.

By S. A. WHITE, M.B.O.U.

The Everard Range is situated about 300 miles west of Oodnadatta, and extends from east to west for about fifty miles, the western end nearly reaching to Officer Creek. It consists of ridges and isolated boulders of granitic rock, of a reddish-brown colour. Mount Illbillie (3,000 ft.) is the highest point. Fine wide valleys intersect these high ridges, and amongst the rocks large rockholes are to be found, capable of retaining water for some considerable time.

In and around the range dwells a fine race of people, well grown, well nourished, and well disposed towards white men. It is divided into many parties, or tribes, each one having its own allotted district. Owing to the nature of the country and the great dryness, also the uncertainty of food supply, these tribes are broken up into still smaller parties, which in some cases were not more than a man and wife with one or two children. Nothing has been written, as far as I can ascertain, about these people, with the exception of that

by Mr. Richard Helms, who accompanied the Elder Exploring Expedition, 1891-2, and he only speaks of seeing two or three Everard men when passing by the ranges. So I hope the following notes may be of scientific interest.

Quite a number of both sexes and all ages were met with, and I was able to spend several days (without any white companion) in their camps, which enabled me to gather much information that otherwise could not have been obtained. Both men and women were well grown and nourished. Most of the men bore many scars upon the chest, shoulder blades, back, and arms. The women also have these scars, but in a lesser degree. Both sexes are destitute of covering, moving about in a nude state; the men very often have a twisted hair-cord round their waists, which acts as a means of carrying small articles, and also when drawn tightly round the body will reduce the pangs of hunger. They do not try to cover the person in any way, but the men, both young and middle-aged, were often seen with eagle-down twisted into the pubic hairs; in some instances it was left the natural colour, while in others it was stained with red ochre; this ornamentation did not in any way cover the penis, nor was it intended to do so, I am sure.

The young bucks spend much of their time in the braiding of their hair, which is drawn tightly back from the forehead, then done up in a chignon and bound tightly together with human-hair string, often being decorated with brown hawks' feathers. This chignon stands out ten or twelve inches at the back. In most cases the women's hair was fairly short; this being due, most likely, to their having to supply the material for hair string. In many cases the young women brought the hair forward and tied it up in a small knob over the forehead, with many bands of hair string bound round and round the head.

It was very surprising to find that many of the women carried live wild dogs round their waists—the fore paws and nose being grasped in one hand, while the hind paws and tail are in the other; the extremities of the dogs, in some cases, almost meeting in front. As far as the limited knowledge of the language would allow, it was ascertained that all women who were barren or had ceased bearing children were required to nurse a dog in this way.

There were a good many children in arms, which were all females with the exception of one; these children, as well as others of various ages, were all well nourished, being plump and jolly.

All the men are circumcised after the age of about eighteen or nineteen years. One example of slitting the urethra came under notice, but this does not seem a regular custom. They

all have the septum of the nose pierced, to carry the wing-bone of a bustard or an ornamental stick. This operation is performed at a very early age (see pl. lvii., fig. 1), and seems to be the starting-point at which the initiation rites begin. No very old men or women were seen, nor were there any cripples, and every effort failed to gain information as to what becomes of the aged members of the tribe, for they avoided every question put to them and showed a strong dislike to discuss the question. I am strongly of the opinion that they kill and eat their old people and destroy all deformed children. They are very fond of relating how the Musgrave natives (for which they show great fear and call "Mamoo," always repeating the word in an awe-inspiring tone) have killed and eaten their men and women, and great pains were taken on one occasion to point out where one of their women and a child were killed by the "Mamoo," and a short way off the ashes of a fire were shown as the place where the woman and child were cooked and eaten. There were some particles of bones about, but if human or not I could not say. There is no doubt in my mind that they do eat one another.

Many of the women were of quite graceful form, and the distended abdomen, so common amongst the Australian natives, was almost absent amongst these people, showing that their food supply must be regular and good.

The men smear their bodies with red ochre, and the young bucks have their chests decorated with the white down from the wedge-tailed eagle in the shape of a crescent, which extends from one armpit, round the chest, to the opposite armpit; the down is stuck by the agency of human blood.

The men use the native tobacco (*Nicotiana suaveolens*, var. nov. *excelsior*),<sup>(1)</sup> which grows very abundantly in one locality at least. The leaves of this plant (which often attain the length of 8 to 10 inches) are rolled up into a ball and used as a narcotic, allowing it to rest between their lips and turning it over occasionally by means of the tongue, which causes a yellowish green juice to cover the corners of the mouth and lips. The women were not seen using it at any time.

*Weapons and Utensils.*—The principal weapon is the spear, called "ooruta," which is mostly of a single barbed variety, the head, which is attached to the shaft by means of tendons and sinews, is flat and made from mulga wood, with a curved tooth or barb of the same material, also bound on by means of sinews; the shaft, which is nearly always in two pieces, is from 9 ft. to 9 ft. 6 in. long. They hunt the kangaroo, wallaby, and rabbit, etc., also fight, with this spear.

(1) See Mr. Black's paper on Botany, p. 835.

A thick mulga stick is also carried, called "wanna." This is from 2 ft. to 3 ft. long, sharpened at one end and hardened by fire, and is used for many purposes, but principally for digging out food. They use a small wooden food-and-water bowl, about 1 ft. long by 3 in. or 4 in. broad, called "wera"; more often it is used as a scoop to remove earth and sand, after it has been loosened by the "wanna," when in search of rabbits, lizards, etc. A spear-thrower, which they call "mira," is very different to any other I have ever seen. It is deeply concave on the upper side; in this hollow the spear rests. The peg or tooth which takes the weight of the spear when thrown is bound on by sinews and resin. At the handle-end a piece of flint, of a chisel shape, is cemented in very firmly by means of porcupine grass resin. All these articles were carried by the men. Boomerangs are not made or used by them. A large food-and-water bowl cut out of wood, called "mika," is used by the women, and is generally large enough to hold a big child; the children are often placed in these large wooden dishes or bowls and then stuck up in the fork of a tree, with a bunch of leaves over the top to keep the sun off the child while the mother hunts for food.

*Food.*—The supply, even in the Everard Range (which is a rich country compared with some), must vary considerably. Kangaroos are plentiful in some districts. These animals shift about according to rainfall. Amongst some of the great piles of granite rocks, as at Moorilyanna native well, rock wallabies are numerous, and the favourite time for the natives to hunt them is just after sundown, when the marsupials come out on the rocks, which have been heated by the afternoon sun. Emu eggs in season yield an excellent food. Numerous species of lizards are prized by the natives as an item of food. Nearly all their food is cooked in their usual excellent manner—namely, in the sand, which retains the full flavour of the game. Of vegetable foods I saw little, owing to the prolonged drought; but in good seasons there must be great quantities of edible seeds, for large grinding-stones are found very frequently all over the country near the ranges, and by their concave surfaces they must have been used for grinding purposes for many years. The fruit of the native fig (*Ficus platypoda*), and called by the natives "Elie," was eaten by them. The wild dog, or dingo, is much relished by the natives as an article of diet, and rarely an old camping-ground came under notice without there being many dingo skulls and bones scattered around; yet the natives domesticate and fondle over their dog pets. Sugar ants (*Melophorus inflatus*), called by these natives "woma," are much relished. They dig large pits up to 4 ft. or 5 ft. deep in search of the ants; grasping them by

the forepart of the body they bite off the inflated abdomen, which contains the sweet fluid. One of their, if not the chief, foods is their "margu," being the larvae of a big moth found in the roots of the broad-leafed mulga (*Acacia kempeana*). The natives seem to detect the grub at the roots by the foliage of the tree, and at once strike the ground with their pointed stick, "wanna," to find the position of the root. Having ascertained this, they soon loosen the earth around and thrust the pointed end of the stick under the root and pressed up sufficiently to be grasped by the hands and forced away from the stem, and at the junction of stem and root the large grub is invariably found. It is sometimes eaten raw by biting off the head and squeezing the contents into the mouth, but they are more often placed in the hot ashes for a few minutes, when the skin is roasted like parchment and the contents attain the consistency and colour of the yolk of an egg, and is of a nutty flavour.

*Water supply.*—During good seasons no doubt there are many clay-pans and swampy places, also temporary streams, which would allow the natives to hunt over a large extent of country; but in dry times, such as it was during this expedition, they are dependent on rock-holes and native wells, the latter being rare and generally shallow dug-outs close to shelving rocks, the catchment holding the water under the sandy soil. The rock-holes are a great feature of this granite country, many being large cisterns, capable of holding hundreds of gallons, while others would only hold a pint or so. To prevent birds and other things getting into the water the natives put boughs and sticks into it, which often discolours and gives the water a bad taint; in some instances sand is placed in the holes to prevent evaporation.

*Native Art.*—If anyone could see these natives decorated for ceremonial purposes it would be admitted at once that they possess much decorative skill, the lines upon their bodies being beautifully executed and some of them of striking design. Their rock paintings are very strange, and if the language had been better known much interesting information in connection with these could have been obtained. Red and white were the principal colours, but often designs were made in black. Emu tracks are very often reproduced, also the rough representation of the human form; one painting was described to me as a hunting sketch, the emu tracks representing a bird going in a certain direction; then other tracks having been seen an old and a young man had gone one way, while an old man and two young ones had gone another way, this painting having been executed to depict a certain hunt.

*Personal characteristics.*—They are a good-natured, happy-go-lucky people. Of course, their characters are as varied as those of the white race; there are cheerful as well as sullen individuals. But, taking them on the whole, they are a happy people, extremely fond of their children; two or three big children have often been seen to throw their arms around their mother and caress her. The men give up much of their time to entertaining the boys and girls; but whatever the amusement may be it is always in the form of an educational matter. For instance, at night they will smooth the sand down in the firelight, and a man will make different tracks of birds, mammals, insects, etc., with a piece of stick, then there will be a guessing competition, and if one of the youngsters make a "howler" they will all chaff him about it. At an early age the girls follow their mothers out hunting for food, and are soon drawn into the almost incessant work of food hunting, which is looked upon as a woman's work. The boys follow their fathers, and when quite young are started to make toy spears and trained how to throw them, the favourite target being a white ants' nest or hill. These dark reddish-brown masses of clay have been seen covered with shattered spears, their points having pierced the hard outside covering. Their hair is dark and coarse; some long and vigorous beards were seen, yet in some instances the face was almost destitute of hair. Some of their bodies were very hirsute—legs, arms, and chests being covered with long dark hair. They sleep upon the bare ground in a row, with a small fire between each pair; more than twenty have been seen in a line, thus one fire does for two men. They were quite without covering, and the fires required replenishing every little while throughout the night. One of the natives who accompanied us acquired some cast-off clothing, and he was seen wearing it all through the heat of the day, but when the severe cold set in at night, and he lay down between two fires, he divested himself of all clothing.

*Shelters.*—During wet or inclement weather shelters are put up, principally for the mothers and young children. This is done by placing two forked sticks together, with a third leaning away from the weather side, forming a triangle; against this boughs are placed, then porcupine or other grasses are heaped up. Many of these shelters are seen in different stages of decay near good watering-places, but never close up to the water, for the natives always form their camps out of sight, if possible, so that they do not disturb the game or reveal their presence to other natives. Many travellers say that these shelters made by other tribes are not used the second time, because it is easier to construct new ones; this has not



been my experience, for I have always found that superstition has been the chief cause, and have been told time after time by the natives that as soon as they vacate a dwelling the evil spirit takes up his abode therein, and they cannot be induced to enter the shelters again under any consideration.

*Fire Sticks.*—They always carry a lighted stick, or one or two if there is a large party on the move, taking it in turns to carry the torch, which is swayed about to keep it burning. This points to the fact that the process of making fire is a difficult one, and that they go to great pains to avoid it. Upon being requested to make fire, an old native took his spear-thrower and struck a piece of hard stone with the chisel-shaped flint attached to the handle-end of the "mira"; sparks were certainly produced, but he had no tinder, nor did he show how the sparks were caught. Many of the men and women had large scars upon their bodies, in some instances quite raw ones were seen upon the children. Upon making inquiry, it was found that this was caused through the agency of fire by rolling on to the embers during sleep.

*Ceremonial Dances.*—I was present at several of these, which were quite new to me, not having seen the same performances with any other tribe. One had only three dancers (young men of twenty-five to thirty); their hair was bound up with hair string and protruding a great distance at the back, being decorated with hawks' feathers; their bodies were reddened with ochre, and two half-circular lines of white down from the wedge-tailed eagle adorned their chests; large tufts of white down were attached to the pubic hairs, a wand was carried made from a straight gum-bough, and was about 4 ft. 6 in. long, a bunch of leaves being left at the top, and from that down the bark was stripped off clean, the bare wood being smeared with human blood, and evidently while the blood was wet three rings of white down had been stuck on. The women, men, and children sang a low, monotonous song, almost in a whisper at first, but after a time it swelled in volume and became louder and louder, many of the singers keeping time by beating the ground with their short-pointed sticks. When the song had reached its highest pitch the three performers dashed out of the scrub (which was wrapped in darkness) into the bare space in front of the fires and singing loudly, keeping time by stamping the ground with great force with the right foot. They stood in the same place for some time, and soon had a hole stamped in the sandy soil 8 in. or 10 in. deep. The song died away in cadence and became lower and lower. The performers had been facing the east; they now turned to the west, still stamping vigorously, this time with the left foot. When the song had died down to a mere

whisper the performers rushed back into the darkness. This was repeated many times, and the last time, when the chanting or singing had died gently out, the men lay flat down with their faces to the ground, and this was the *finale*.

In conclusion, I must say that the Everard natives are the finest that it has ever been my fortune to meet, but the hundreds of miles of arid country will not protect these fine people much longer, for white men are pushing further out each year, and will very shortly come in contact with this wild race: then customs, traditions, everything, will be lost beyond recall. All this information should be obtained before it is too late.

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### Language of the Everard Range Tribe.

By J. M. BLACK.

A small list of words in the language of the Everard Range natives was compiled by Capt. White, and has been entrusted to me for phonetic expression. The difficulty of obtaining the words was considerable, because the tribe is quite untouched by white influences and knows no English. A black boy from Ocdnadatta and another from the Alberga, who accompanied the expedition, were useless as interpreters. The only word which they seemed to have in common with the Everard men was *wi:ra*, the wooden bowl for food, and this discovery created surprise on both sides.

The alphabet used is that of the International Phonetic Association, and the characters which require explanation are as follows:—

u when long, sounds like *oo* in "boot"; when short, like *oo* in "foot."

o is the English *o* in "not."

a when long, is the English *a* in "father"; when short, it is the Scottish *a* in "man."

ā is a sound half-way between *a* in "father" and the English *a* in "man"; it is the French sound which is heard long in "page" and short in "patte."

ə is the English sound heard in "butter" [*'bətə*]

e sounds nearly as in the English "they."

ē is the open English *e* in "bed."

i is a close sound very nearly equal to English *ee* in "meet." It may be long or short.

ī is the open sound heard in English "fit," "very" [*fit*, *veri*]. It is always short.

ai = *y* in "my."

A long vowel is indicated by the sign [ : ] placed after it, but it should be remarked that the vowels here, as in other Australian languages, differ rather in quality than in quantity; that is to say, they are distinguished rather by their articulation than by their length. The stressed or accented syllable is indicated by the sign [ ' ] placed *before* it; so that, for example, the accentuation of the English words "instance" and "exact" would be shown thus [ 'instəns, ɛg'zækt ].

Of the consonants it need only be said that j = English *y* in "young"; η = *ng* in "singer"; θ = *th* in "thin."

al'kaka, general name for ant.

andə'grɪnɪjə, name of one of the clans of the tribe.

'bi : a, snail-shell.

'dirɪkɪn, brown hawk (*Ieracidea berigora*).

'e : bo, stone.

'elgə, wireworm (Larva of *Tenebrionidae*, sp.).

gɛ'rəŋkɪbɪ, black-eared cuckoo (*Owenavis osculans*).

'i : bru, rock-pigeon (*Lophophaps plumifera leucogaster*).

'i : bi, breast.

'i : lɪ, native fig-tree (*Ficus platypoda*).

'ɪmpu, trap-door spider.

'kapi, water.

ka'titi, teeth.

'kaman, giant tobacco (*Nicotiana suaveolens*, var. *excelsior*).

'kaljə, emu (*Dromoeus novae-hollandiae*).

'kulbi, rock-painting.

kəm'pombəri, cockroach (*Anamesia lindsayi*).

kən'taltabu, ant lion (*Myrmeleonidae*, sp.).

'maira, band.

mai'θəndə, spinifex snake (*Demansia modesta*).

'magu, large grub found in the roots of mulga (often called "witchita," after its name in another aboriginal language).

ma'mu : , the Musgrave Ranges tribe (of whom the Everard tribe express great fear).

mai'lalərɪlɪ, blue wren (*Malurus melanotus callainus*).

'mə : bain, kangaroo (*Macropus rufus*).

'mɪnɪ'mɪnɪ, white-face (*Aphelocephala castaneiventris whitei*).

'mɪlgən, sharp bone used as a needle.

'mɪlkə, red-backed ground thrush (*Cinclosoma castanotum dundasii*).

'mu : kɪ, mouse.

'mu : ru, spear-thrower (wommer).

mu : rə'dɪŋgə, small striped lizard.

'nokəm, egg.

- 'panpan, fly (insect).  
 'papa, dog. (When emphasis was laid on this word, in pointing to the animal, the vowels were lengthened [pa:pa:] and equal stress was placed on both syllables.)  
 'pə:lin, thrush (*Colluricincla rufiventris whitei*).  
 pi:ləl, black magpie (*Strepera*, sp.[?]). Evidently an imitation of the bird's cry. The two syllables have almost equal stress; the first has a rising tone, the second a falling one.  
 'pɪlbəm 'pɪlbəm, singing honey-eater (*Meliphaga sonora*).  
 tel'bəŋgì, white-eyebrowed wood swallow (*Campbellornis superciliosus*).  
 tɛŋ'gìli, grass wren (*Diaphorillas textilis purnelli*).  
 titi'ara, spiny-cheeked honey-eater (*Acanthagenys rufogularis cygnus*).  
 ti'ti:ə, rockhole.  
 tu'təmbi, rock lizard (*Amphibolurus rufescens*).  
 'tu:kliɡa, *Acacia strongylophylla*.  
 'θadì, common spotted lizard (*Amphibolurus reticulatus*).  
 u'ru:ta, spear.  
 u:w, yes.  
 'wana, yamstick.  
 'walja, head.  
 'waru, fire.  
 'wata, spearhead.  
 'wi:ra, wooden bowl.  
 'wɛlda, wedge-tailed eagle (*Uroetus audax*).  
 'wətərìli, yellow-throated minah (*Myzantha flavigula*).  
 'wəma, sugar ant (*Melophorus inflatus*).

Some of these words are the same as those collected by R. Helms during the Elder Expedition of 1891 among the tribes of the Everard and Blyth Ranges, who evidently speak the same language. For purposes of comparison these words are given in Mr. Helms' spelling:—pia, shell (this evidently = bi:a, given above for "snailshell"); ibi, breast; kapi, water; karditti, teeth; kaleya, emu; kulbi, rockpainting; kumbumberi, cockroach; maira, hand; meru, spear-thrower; nokum, egg; papa, barking of a dog; wanna, yamstick; wera, wooden bowl; wilda, eagle; ō, yes. The difference of meaning given to the word "papa" is curious, but some light is thrown on the subject by the vocabulary of the Parnkalla (Eyre Peninsula) language, published by the Rev. C. W. Schürmann in 1844, where "pappa" is given as meaning a young animal, whelp or pup. The following words, taken from the vocabulary of the Lake Amadeus and George Gill Range aborigines, which was published by Mounted Constable

Willshire in 1891, show that the language spoken there is the same as that of the Everard tribe:—ippee, breasts; cobbie, water; curlier, emu; murra, hand; mear-roo, spear-thrower; puppa, dog; warroo, fire. Mr. Willshire's spelling has been retained. The language of the Everard Range tribe has, therefore, a fairly wide area in our North-West, in the south-western corner of the Northern Territory, and probably extends some distance into Western Australia. It has a close affinity to the Parnkalla, in Eyre Peninsula, and this again is one of the great family of languages which are (or were) spoken from Cape Jervis northwards along the coast, on Yorke Peninsula, and thence into the Far North, following generally the line of the Flinders Range, and which are linguistically well marked off from most of the native tongues spoken to the east of them, from the Murray mouth right up to Cooper Creek and the Finke River.

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(c) MAMMALIA AND OPHIDIA.

By EDGAR R. WAITE, F.L.S., Director, South Australian Museum.

[*Contribution from the South Australian Museum.*]

The mammals and snakes obtained during the expedition are few in number and are well known from Central Australia. Occasion has, however, been taken to redescribe *Acanthophis pyrrhus*, Boulenger, of which several specimens are in the collection of the South Australian Museum. Field notes supplied by Captain White are appended within brackets.

**Mammalia.**

**MURIDAE.**

**ASCOPHARYNX CERVINUS, Gould.**

*Hapalotis cervinus*, Gould: Proc. Zool. Soc., 1851, p. 127, and Mamm. Aust., iii., 1863, pl. x.; Spencer: Rep. Horn. Exp. Cent. Aust., ii., 1896, p. 11.

*Conilurus cervinus*, Ogilby: Cat. Aust. Mamm., 1892, p. 120.

*Thylacomys cervinus*, Waite: Proc. Roy. Soc., Vict., x., 1898, p. 122, pl. vi., fig. 3.

*Ascopharynx cervinus*, Waite: Ann. Mag. Nat. Hist. (7), v., 1900, p. 223.

*Notomys cervinus*, Thomas: Ann. Mag. Nat. Hist. (7), xvii., 1906, p. 83.

Seven specimens were obtained at Wantapella Swamps and one at Indulkana, July, 1914. The gular pouch is present in all specimens of both sexes, and, as far as known, the

pouch occurs only in this species of Australian Muridae. Mr. Oldfield Thomas does not regard the possession of the pouch as a character of generic import, and therefore assigns the species to the genus *Notomys*, in which he also includes *N. mitchelli*, *N. longicaudatus*, and *N. richardsoni*.

In the interesting introduction to his "Index generum Mammalium," Palmer <sup>(1)</sup> cites the case provided by the nomenclature of the genus as an example of confusion arising from a misprint. He writes:—"Waite, in proposing the name *Thylacomys* for an Australian mouse, called attention to an obscure name given by Owen many years previously to a group of marsupials, but contended that because the latter was spelled *Thalacomys* (an obvious misprint), it did not pre-occupy his name. Subsequently it was shown that Owen's name was in reality first printed *Thylacomys*, but it appeared in one publication and the description in another, so that the name might be considered a *nomen nudum*. It had, however, been used afterwards in correct form in connection with a marsupial prior to its application to a mouse. Waite, therefore, admitted that his *Thylacomys* was preoccupied, and replaced it by a new name. Thomas, while admitting the claims of Owen's name, with characteristic caution preferred to adopt the evident misprint, *Thalacomys*, which was published with a description, instead of the correct and really earlier *Thylacomys*."

[This wonderful little rat was seen more than once at mid-day in the mulga scrub. When alarmed it places its tail over the back and head and moves on its hind legs only. When in full flight it is difficult to ascertain what the moving object really is, appearing as little more than a blur. On one occasion with two companions I chased one of the rats round and about the bushes, finally running it to earth in a small burrow. We dug it out in company with two large lizards. The natives use the tip of the tail as an ornament.]

In this connection it may be mentioned that the tails used in all ornaments from Central Australia preserved in the South Australian Museum are those of the Rabbit Bandicoot (*Peragale lagotis*).

#### MUS HERMANSBURGENSIS, Waite.

*Mus hermannsburgensis*, Waite: Rep. Horn Exp. Cent. Aust., ii., 1896, p. 405, pl. xxvi., fig. 5.

Seven examples taken at Carmeena, Everard Range.

[The mouse is not very common, but is found among the granite boulders in the Everard Range: it is known to the natives as "Menkie."]

(1) Palmer: U.S. Dept. Agric., N. Amer. Fauna, No. 23, 1904, p. 27.

## MARSUPIALIA.

## PETROGALE LATERALIS, Gould.

*Petrogale lateralis*, Gould: Mon. Macrop., 1842, pl. xxiv.

Of the six specimens obtained, five were taken at a native well at Moorilyanna and one at the Granite rocks.

[Rock wallabies are very numerous in places among the great granite boulders, where they hide all day. At sundown they come out and bask on the western side of the boulders which has been warmed by the afternoon sun. At this time they may be somewhat easily approached, as they are engaged in cleaning their fur after the manner of a cat. Their flesh is not so good to eat as that of the brush wallaby.]

## Ophidia.

## DEMANSIA MODESTA, Günther.

*Cacophis modesta*, Günther: Ann. Mag. Nat. Hist. (4), ix., 1872, p. 35, pl. iii., fig. c.

*Furina ramsayi*, Macleay: Proc. Linn. Soc., N.S.W., x., 1885, p. 61.

*Diemenia modesta*, Boulenger: Cat. Snakes, Brit. Mus., iii., 1896, p. 324.

*Demansia modesta*, Waite: Trans. Roy. Soc., S.A., xxxviii., 1914, p. 445, fig. 2.

Several young examples were secured on the Everard and Musgrave Ranges. In all the frontal shield is broader than the supraocular. Boulenger states it is not so.

[The little banded snakes were often seen on the sand during the heat of the day, and despite their agility the camels frequently trod upon them.]

## PSEUDECHIS AUSTRALIS, Gray.

*Naja australis*, Gray: Zool. Misc., 1842, p. 55.

*Pseudechis australis*, Günther: Ann. Mag. Nat. Hist., (3), xii., 1863, p. 362; Waite: Trans. Roy. Soc., S.A., xxxviii., 1914, p. 445, fig. 1.

The only specimen preserved is a very large one, perhaps the largest recorded, totalling 1,640 mm. in length, of which the tail measures 200 mm. There are 205 ventrals and 42 + 11 pairs of subcaudals; the anal is divided, and there are twenty scales round the body, the even number being unusual.

[This specimen is the largest snake I have seen in the interior. It was basking upon some dead branches, and when disturbed became very savage, making repeated attempts to strike.]

## ACANTHOPHIS PYRRHUS, Boulenger.

*Acanthophis pyrrhus*, Boulenger: Ann. Mag. Nat. Hist. (7), ii., 1898, p. 75.

A single small specimen received from the Everard Range suggested an examination of all the examples of

*Acanthophis* from Central Australia preserved in the South Australian Museum. The Death Adder is known to be a very variable species, and there has been an inclination to regard *A. pyrrhus* merely as a particularly ruddy form of *A. antarctica*. Having, however, nine specimens for study, I find that the characters are quite constant, that the species is well founded, and that all our Central Australian examples prove to be referable to this form.

*Description.*—Rostral fully twice as broad as deep; internasals slightly longer than broad; prefrontals four, as long as the internasals; frontal one-half longer than broad, as long as the internasals and prefrontals together, equal to or longer than the parietals, and as broad as the supraoculars. Eye surrounded by six scales, one preocular, one supraocular, two suboculars, and two postoculars. Nasal long and undivided, in contact with the rostral, internasal, outer prefrontal, preocular and the first three labials. Temporals, 2+4. Six upper labials, the third larger than the fourth, the fifth the largest. With exception of the labials all the upper head shields are very rugose. Four lower labials in contact with the anterior chin shields, which are expanded and longer than the posterior pair. Scales in 21 rows, dorsals strongly, laterals feebly keeled. The anal is entire, and the number of ventral plates, etc., is shown below, the specimen described being lettered *a*. Colour bright orange-red, with dark cross-bars above, formed of three longitudinal scales, each bar separated by a similar interspace; end of tail, including the spine, dark-grey with black bands. Lower surfaces yellow, the two lower rows of lateral scales each with a black spot, especially conspicuous in the anterior part of the body.

It will be noticed that the description agrees quite well with that of the type specimen, excepting as regards the number of temporal shields: Boulenger renders them as 3+4, but in all our nine examples the anterior shields are but two in number.

DETAILS OF NINE SPECIMENS.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	
Ventral shields	149	147	147	153	155	142	142	152	141
Sub-caudal shields ...	$26 + \frac{2}{2} + \frac{1}{4}$	$25 + \frac{2}{2} + \frac{2}{2}$	$13 + \frac{3}{3} + \frac{1}{4}$	$26 + \frac{2}{2} + \frac{1}{4}$	$30 + \frac{2}{2} + \frac{8}{8}$	$29 + \frac{2}{2} + \frac{9}{9}$	$29 + \frac{2}{2} + \frac{3}{3}$	$27 + \frac{2}{2} + \frac{6}{6}$	$25 + \frac{2}{2} + \frac{9}{9}$
Total length in mm. ...	690	545	540	490	487	390	345	290	210
Length of tail in mm. ...	90	87	83	67	86	69	50	50	34



*Localities:—*

*a, c, e*—Central Australia, coll. R. T. Mitchell, 1897.

*b*—Finke River, coll. C. Winnecke, 1896.

*d*—Barrow Creek, coll. Thos. Hanley, December 24, 1907.

*f, g, h*—Barrow Creek, coll. F. R. W. Scott, September 24, 1908.

*i*—Everard Range, coll. Capt. S. A. White, July, 1914.

[The pink adder was found under a bush of porcupine grass (*Triodia*); it showed fight and flattened out its neck to a surprising extent. The natives expressed great fear of the snake, and called it "Mythunda."]

I have pleasure in acknowledging assistance rendered by Mr. Herbert M. Hale in the preparation of the drawings accompanying this paper.

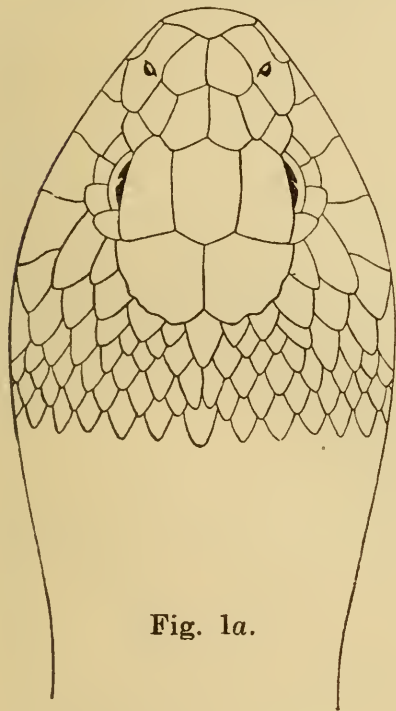


Fig. 1a.

Upper view of Head.

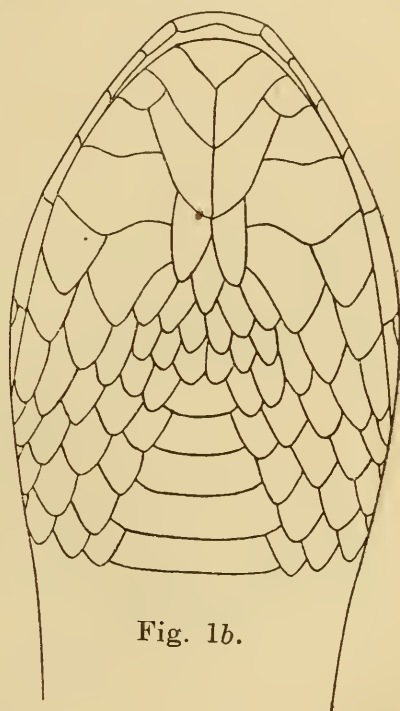


Fig. 1b.

Lower view of Head.

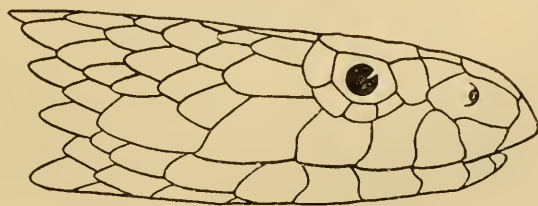


Fig. 1c.

Head in profile.

(d) AVES.<sup>(1)</sup>

By S. A. WHITE, M.B.O.U.

## Order CASURIIFORMES.

## Family DROMICEIIDAE.

## DROMICEIUS NOVAE-HOLLANDIAE, Latham (Emu).

Owing to the country being in such a very dry state these birds must have shifted to where food and water were more plentiful. Emu tracks were seen in the sand and soft earth in many places. Two or three bunches of feathers were seen with the natives, who gave me to understand when rain fell emus would be plentiful. The natives are fond of depicting this bird in their drawings, and hardly a series of drawings was seen without numerous sketches of emu tracks and eggs.

## Order GALLIFORMES.

## Family MEGAPODIIDAE.

## LEIPOA OCELLATA, Gould (Western Mallee Fowl).

I am induced to put this down to the western form (although I have not handled the bird), because all the north-western birds are more closely allied to the western forms. Old nesting mounds were seen. It can be well understood that this bird would move off to better-watered country, for during the last drought, which covered such a long period, there would not have been sufficient moisture to incubate their eggs.

## Order TURNICIFORMES.

## Family TURNICIDAE.

## AUSTROTURNIX v. VELOX, Gould (Little Quail).

While passing through some high kangaroo grass (*Anthistiria ciliata*), close to Tietkens' Birthday Creek, several quail were flushed, and although the birds were not handled I feel sure they were of the above species. The only other occasion upon which they were seen was when we were passing through the foothills of the Musgrave Ranges. The country was in too poor a state for these birds; the grasses not having seeded for years, the quail had probably migrated to better country.

## Order COLUMBIFORMES.

## Family COLUMBIDAE.

STICTOPELEIA C. CUNEATA, Latham  
(Eastern Spotted-shouldered Dove.)

This bird was very plentiful along the Alberga and other creeks till we reached about a hundred miles west of Oodnadatta;

(1) The nomenclature of this section (Aves) is after Gregory M. Mathews, F.R.S., "A List of the Birds of Australia, 1913."

then it disappeared altogether, and from what I could gather from the natives it is not found either in the Musgrave or Everard Ranges.

PHAPS C. CHALCOPTERA, Latham (Bronze-winged Pigeon).

At one or two of the rock-holes these fine pigeons came in to drink in the dusk of the evening; in fact, there were some instances when it was quite dark, and they could only be identified by the sharp clapping noise made by the wings. In every case they were found to be very timid.

LOPHOPHAPS PLUMIFERA LEUCOGASTER, Gould

(White-bellied Plumed-Pigeon).

There is not the slightest doubt that this bird inhabits the Musgrave Ranges, although I did not see the bird there myself. Mr. Jack, after one of his flying trips to the southern side of the ranges, reported having seen a small party of pigeons, and from the description of colour and flight there is little doubt it was this bird. They were met with in large parties in the Everard Range. Whenever we came to a rock-hole there was sure to be a party of these little pigeons close by. Morning and evening they were found a few hundred yards out upon the plain, feeding amongst the low bush. As soon as disturbed, they made for the rocky sides of the range in a series of short flights, rising quickly, often with a clapping of wings, which were beaten very rapidly at first to attain an elevation of about twenty feet, when the wings are spread out, slightly drooping at the tips; in this position they are kept rigid till the bird floats in a most graceful manner to the ground. As soon as the bird alights upon its feet it runs very rapidly over the ground, with crest erect, and should it find it is being followed it will again rise upon the wing and repeat the performance till the granite rocks are reached, where the bird harmonizes so with its surroundings that it is soon lost to sight. When the pigeon alights upon the rocks it runs very rapidly, bobbing its head up and down, causing the graceful plume upon the head to wave in a very pleasing manner. The eggs, which are two in number, are laid on the bare sand, and formed round, somewhat to the shape of the bird's body. The situation selected is generally under a low bush. One day my assistant came upon a broody bird, and when several yards off the bird ran out to meet him, with feather fluffed out in a great rage, following the intruder until he was some distance from the nest. Strange to say, this proved to be a male bird. The roosting-place is upon the ground, under the leese of a low bush, several squatting close together. From the quantity of

excreta seen they must frequent the same roosting site for months at a time. Their flesh is white, tender, and of excellent flavour. From specimens taken they seem more robust and stronger-marked birds than those we collected in the central regions the previous year. The natives call this bird "Ebru."

OCYPHAPS L. LOPHOTES, Temminck (Crested Pigeon).

These beautiful pigeons were found fairly numerous near water-holes on the Alberga, but became less numerous as we worked west. A number came in to water at Wantapella Swamp each morning and evening; disappearing as we entered granite country. They are a much more trustful bird in comparison with the Bronze-wing (*Phaps c. chalcoptera*), and when a party of these birds are moving over the ground in search of food, raising and lowering their beautiful crests, it is a very pretty sight.

#### Order PODICIPIFORMES.

##### Family PODICIPIDAE.

POLIOCEPHALUS P. POLIOCEPHALUS, Jardine and Selby  
(Hoary-headed Grebe).

After leaving Todmorden and travelling up the Alberga River, we met with these birds in most of the water-holes. They were not plentiful; two or three were the most seen at one water-hole. They showed no variation from the southern bird.

#### Order CHARADIIFORMES.

##### Family VANELLIDAE.

LOBIBYX NOVAE-HOLLANDIAE, Stephens (Spur-winged Plover).

If this bird be a resident in the north-western corner of the State I was unable to ascertain, but the call was heard on several occasions at night during the first part of the journey.

##### Family CHARADRIIDAE.

ELSEYA M. MELANOPS, Vieillot (Black-fronted Dotterel).

Like the grebes, a few of these birds were seen at all the waters along the Alberga, but as soon as the last water-hole was left behind us these birds were not seen again. There is no doubt they breed in the interior, for a female bird went through all the antics of a wounded bird to entice me away from young and eggs; she fluttered along the ground a few paces in front of me, rolling over on her side at times, as if exhausted with her struggles.

## Family GLAREOLIDAE.

PELTOHYAS A. AUSTRALIS, Gould (Australian Dotterel).

While travelling over a very stony tableland a party of these interesting birds was met with; they were running over the stony ground very rapidly, and their colouration harmonized so well with the gibber stones around them that when stationary it was almost impossible to tell bird from stone. After the first shot they made off very quickly. Those specimens secured were all males. Although a sharp look-out was kept for these birds, they were not again seen. What they can get in the shape of food on the fearfully dry gibber plains or stony desert country is a wonder, but when the stomach contents have been worked out this may throw some light upon the subject.

## Family BURHINIDAE.

BURHINUS M. MAGNIROSTRIS, Latham (Eastern Stone Plover).

The bird was not actually seen, but that is only natural, for they keep very close to the ground when danger is near, and their colouration is so like their surroundings that it defies detection at times. Their unmistakable cry was heard on more than one occasion at night time.

## Family OTIDIDAE.

AUSTROTIS A. AUSTRALIS, Gray (Australian Bustard).

This fine bird was not at all numerous, a fact due to the great drought, no doubt. In places where a few light showers had fallen and the herbage made its appearance some of the bustards had collected, but were extremely shy, and were seldom seen before they were on the wing. It is a great wonder how such heavy birds can rise upon the wing amongst the thick mulga where they often are to be found. In several places feathers were seen, showing where the natives had made a capture.

## Order PSOPHIFORMES.

## Family ARDEIDAE.

NOTOPHOYX NOVAE-HOLLANDIAE, Latham

(White-fronted Heron).

It was not unusual to meet with this bird near the large water-holes which last for many months after the river ceased to run. This was especially noticeable on the Alberga. The birds were either flushed from the edge of the water, where they were in quest of food, or they were seen perched in the big gums near the river. As soon as we left the Alberga and entered the dry country these birds were not seen.

## Order ANSERIFORMES.

## Family ANATIDAE.

VIRAGO GIBBERIFRONS, Müller (Grey Teal).

A few were met with on the water-holes while we were travelling along the Alberga ; never in any numbers.

## Order ACCIPITRIFORMES.

## Family FALCONIDAE.

ACCIPITER C. CIRROCEPHALUS, Vieillot

(Collared Sparrow-Hawk).

This was a rare bird in the country travelled through. One or two solitary birds were observed near watering-places, where they kept watch for small birds as they came to drink.

UROAETUS A. AUDAX, Latham (Wedge-tailed Eagle).

These eagles were seldom seen. One or two were met with flying high over the ranges. They are much sought after by the natives for the down, which is used for ornamentation of both the human body and ceremonial sticks.

HALIASTUR SPHENURUS, Vieillot (Whistling Eagle).

A few birds were seen in the large gums along the Alberga River. After the large water-holes were left this bird was not again seen.

FALCO L. LONGIPENNIS, Swainson (Little Falcon).

Was not found a plentiful bird anywhere. A solitary bird or a pair would be met with at water-holes, where they preyed upon small birds, such as finches, which came to water. On several occasions it was seen to sweep on very swift wing through a flock of Chestnut-eared Finches (*Taeniopygia castanotis*), seize a finch, fly with it to a dry mulga, and return in a few moments for another.

FALCO HYPOLEUCUS, Gould (Grey Falcon).

A pair of these birds were met with near Oodnadatta on June 23. They were hopping and dodging round a thick bush, and after observing them for a while it appeared that they were after a Black-and-white Fantail (*Leucorcirca t. tricolor*), which they at last captured and killed. This falcon was not again seen during the Expedition.

IERACIDEA B. BERIGORA, Vigors and Horsfield

(Striped Brown Hawk).

This is the most common of the hawk family in the central regions. They were met with along the dry water-courses and

out in the thick mulga, as well as in the ranges. Specimens examined do not show any variation to those collected north of Oodnadatta the previous year. They are a much lighter bird to those found further south.

CERCHNEIS C. CENCHROIDES, Vigors and Horsfield  
(Nankeen Kestrel).

This very useful bird was not plentiful; still it was widely distributed, and seldom many days passed without meeting with a pair. Habits seem the same as those found south, and food consists chiefly of small reptiles, mice, and insects.

Order STRIGIFORMES.

Family STRIGIDAE.

SPILOGLAUX BOOBOOK MARMORATA, Gould (Marbled Owl).

These owls were often met with in thick-foliaged trees near the water-courses, also among the big masses of rock in the ranges. All species handled show a great deal more white in comparison to those found in the coastal area.

Order PSITTACIFORMES.

Family CACATOIDAE.

EOLOPHUS R. ROSEICAPILLUS, Vieillot (Rose-breasted Cockatoo).

These birds were in great numbers about the township of Oodnadatta. All day long they were hunting about in the stockyards and sand and stony streets for food. When disturbed they would rise in a great flock and alight a few yards further on. They were not seen again until the Officer Creek was reached, when a few birds came under notice.

LEPTOLOPHUS A. AURICOMIS, Swainson (Cockatoo Parrot).

One or two small parties of these birds were seen on the wing while the Expedition followed up the Alberga River, and after leaving the dry water-course they were not met with.

BARNARDIUS ZONARIUS MYRTAE, <sup>(2)</sup> subsp. nov.

(Central Australian Yellow-banded Parrot).

Head and upper part of the neck black; feathers on the cheeks tipped with bright-blue; a broad crescent of bright yellow across the back of the neck; chest and back bright green, rump and upper tail-coverts bright yellowish-green; primaries brownish-black; the basal half external margin

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(2) Named after Mrs. Morgan, the wife of Dr. A. M. Morgan, of Adelaide.

bright blue ; secondaries, internal half brownish-black, external bright bluish-green ; wing-coverts rich greenish-yellow ; two central tail feathers bluish-green, next two bluish-green tipped with light-blue, the remainder having their basal half dark blue ; the remainder light-blue ; abdomen bright yellow ; under tail coverts bright yellowish-green ; iris brown ; feet ashy-grey ; bill bluish-white.

*Type*.—A male, collected by S. A. and E. R. White at Horseshoe Bend, Finke River, Central Australia, on August 8, 1913 ; now in the Wetunga Collection. Female differs in being of a much paler colouration.

Differs from *B. zonarius* in having a much brighter colouration throughout, and in being a somewhat larger bird ; the feathers of the chest and back, instead of being a dark green with an olive tinge are of a bright green ; the rump and upper tail-coverts are of a bright yellowish-green. Its range extends from Oodnadatta north to the MacDonnell Ranges and west to the Musgrave and Everard Ranges. This bird was met with on all the dry water-courses throughout the expedition. They were often found feeding under the acacia trees upon the fallen seeds of that tree. They were breeding at Wantapella Swamp in July, one nest having large young low down in a hollow red-gum. Their note and habits differ little from *B. zonarius*. The size and colouration is the same all over the central region.

PSEPHOTUS VARIUS ROSINAE, Mathews  
(Southern Many-coloured Parrot).

Ref. Nov. Zool., vol. xviii., p. 277, 1912.

Very plentiful in districts where water was found. They were often flushed from the ground amongst the mulga, where they were searching for the seed of that tree. In several cases the male birds had dark brick-red shoulders in place of the bright yellow. Probably this is not consistent, consequently I am not classing it as a new variety.

NEOPSEPHOTUS BOURKII, Gould (Blue-vented Parrot).

This beautiful little parrot was first met with at Flat Rock Hole, where it came in to drink up to nine o'clock at night. Flying round several times in small parties of four or five birds, they uttered a plaintive little whistle, at times almost warbling. They alighted on the bare rock and walked to the water's edge. It is quite possible these birds have made it a practice to come to water late owing to birds of prey as a rule watching watering-places both morning and evening. Later on a small covey of these birds was flushed from amongst the



dry grass, when the camels were passing through some open mulga country. They rose quickly, alighted on a dead mulga for a few seconds, then flew away swiftly out of sight. The crops of the specimen procured were very distended with small grass seeds.

MELOPSITTACUS UNDULATUS, Shaw and Nodder

(Warbling Grass Parrot).

Near a small rock-hole in Tietkens Creek (the hole only contained a few gallons of water) grew a few fine red-gums (*Eucalyptus rostrata*); in one of these a small party of the above parrots were chasing one another in and out the hollow limbs, as if preparing to nest. This was the only occasion on which these birds were seen.

Order CORACIFORMES.

Family PODARGIDAE.

PODARGUS STRIGOIDES, Latham (Tawny Frogmouth).

Very few were seen. Examined one very closely while it was brooding on a nest, and it did not show any variation to the birds found in the middle-north.

AEGOTHELES CRISTATA, White (Owlet Nightjar).

Only one specimen was taken. Upon comparison it was found to mostly resemble specimens collected at Laura, South Australia.

Family ALCEDINIDAE.

CYANALCYON PYRRHOPYGIUS, Gould (Red-backed Kingfisher).

Not often met with, and seems to be able to exist without water, for they were met with in the driest parts of the country. Their call is a very harsh, discordant one, usually uttered from the top of a dead tree, where they will sit almost motionless for hours. Food seems to consist principally of grasshoppers and such like insects; small lizards are sometimes eaten.

Order COCCYGES.

Family CUCULIDAE.

HETEROSCENES PALLIDUS, Latham (Pallid Cuckoo).

Not plentiful. The specimens of females taken show a great deal of rufous colouration on back and wings. From the observations made they confirm my opinion that the female does not make that scale-like call of the male.

OWENAVIS OSCULANS, Gould (Black-eared Cuckoo).

Quite a number of these birds were met with, and their plaintive call of one note was often heard in the dry mulga scrub.

NEOCHALCITES BASALIS, Horsfield  
(Narrow-billed Bronze Cuckoo).

Only one bird was seen, which was taken, and it shows little or no variation to birds found further south.

### Order PASSERIFORMES.

#### Family HIRUNDINIDAE.

HIRUNDO NEOXENA, Gould (Welcome Swallow).

A few seen round the homestead at Todmorden and a few in the ranges.

CHERAMOECA LEUCOSTERNUM STONEI, Mathews  
(Black-and-white Swallow).

This bird was often met with during the journey; in many cases it was nesting in the banks of dry water-courses. The tunnels to the nest varied in length according to the softness of the material through which they had to work. Skins showed no variation to those found round Adelaide.

#### Family MUSCICAPIDAE.

WHITEORNIS GOODENOVII, Vigors and Horsfield  
(Southern Red-capped Robin).

A common bird in the mulga scrubs. No signs of nesting were seen; possibly it was too early, or owing to the drought they had deferred their nesting until such time as rain fell. Quite as many birds were found without the red feathers on the throat as with them, both in the same locality, which makes *W. g. ramsayi* a very doubtful subspecies.

MELANODRYAS CUCULLATA VIGORSI, Mathews  
(Southern Hooded Robin).

Found all over the country traversed. The only variation with specimens taken further south is that the northern bird has a more slender bill, and this is consistent, for all skins collected north of Oodnadatta in 1913 show the same characteristic. These birds in the north-west have a most remarkable call, being identical with the Red-rumped Kingfisher; in fact, so much so that the latter bird was hunted for on hearing the call, and it was some time before this peculiar occurrence was discovered.

## SMICRORNIS BREVIROSTRIS MATHEWSI, subsp. nov.

(Central Australian Tree-Tit).

Differs from *S. brevirostris* in being much lighter on the back, and the yellow of the breast and abdomen being much brighter, the ear-coverts being of a much darker buff and larger. Differs from *S. b. flavescens* in having a much deeper yellow breast, much larger ear-coverts of a darker buff, and colouration of the back much darker. Most resembles *S. b. melvillensis*, but differs in having a rich yellow breast and abdomen, while the Melville Island bird is almost white underneath.

*Type*.—A female collected at Wantapella Swamp by S. A. White on August 18, 1914, and now in the Wetunga Collection. The sexes are alike.

*Range*.—From Oodnadatta north to the MacDonnell Ranges and west to the Musgrave and Everard Ranges. Only met with on or near the water-courses; have never seen it far from the red-gum trees. It spends most of its time hunting amongst the foliage of this tree, and utters a very loud call for so small a bird. Builds a suspended dome-shaped nest, constructed chiefly of cobwebs and small dry leaves, with a little dry grass and leaves, interwoven with a few soft particles of bark, and lined with feathers. Shows no variation with specimens procured north of Oodnadatta the previous year.

ETHELORNIS CULICIVORUS MUSGRAVI, <sup>(3)</sup> Mathews

(Musgrave Fly-eater).

Not having sufficient material for comparison, the specimens were forwarded to Mr. G. M. Mathews, of England, and he has described this bird as above. It was only found in one locality, amongst the thick mulga at the foot of the Musgrave Ranges. Like many other members of the genus, it possesses a beautiful low, sweet note, but for which it would hardly be discovered. The colouration of its plumage is of the same dull hue as the bird's surroundings.

LEWINORNIS RUFIVENTRIS MAUDEAE, <sup>(4)</sup> subsp. nov.

(Central Australian Rufous-breasted Thickhead).

Crown of the head and all the upper-surface bluish-grey, becoming much lighter on the rump and upper tail-coverts; feathers of the head, back, and mantle having a faint dark line down the centre; ear-coverts and lores, also band around the chest (the latter extending upwards on either side of the

(3) Austral Avine Record, vol. ii., No. 7, p. 130.

(4) Named after Mrs. H. L. White, "Belltrees," New South Wales.

ear-coverts) black; throat and abdomen white; breast, flanks, and under tail-coverts washed with rufous; upper-surface of tail greyish-black, edged and tipped narrowly with grey, under-surface of tail dark-grey; primaries greyish-black, very narrowly margined externally with light-grey; secondaries and wing-coverts greyish-black, deeply margined, and the latter tipped with light-grey; iris reddish-brown; bill and feet black.

*Type*.—A mature male collected on the Officer Creek, west of the Everard Range, on August 6, 1914, by S. A. White, and now in the Wetunga Collection.

*Range*.—Extending from Oodnadatta north to the MacDonnell Ranges and west to the Musgrave and Everard Ranges. Differs from *L. r. inornatus* in being much lighter above, the light margins of the secondaries being much deeper, in some cases half the width of the feather, being of very light-grey; the breast only having a wash of rufous colour and the abdomen being white, the bill being much narrower and not nearly so robust.

This bird was met with all over the country between the head of the line and the Musgrave Ranges. Its note is not nearly so melodious as the southern bird, although several notes are in common. Specimens secured are without doubt the same as those collected between Oodnadatta and the MacDonnell Ranges during my expedition the previous year. Birds, even in the second year, although they have the rufous wash and black band (the latter not so pronounced), and have lost the striation of the feathers, do not develop the black ear-coverts and lores till the third year at least.

LEUCORCIRCA TRICOLOR, Vieillot (Black-and-white Fantail).

This bird was widely distributed, but nowhere plentiful. On one occasion a Grey Falcon was seen to chase one of these harmless birds round and through a bush till it was captured. There seems to be little or no difference between this bird and those found further south.

#### Family CAMPOPHAGIDAE.

PTEROPODOCYS MAXIMA, Rüppell (Ground Cuckoo Shrike).

Only met with at one locality—at a large water-hole in the bed of a creek about fifty miles west of Oodnadatta. The birds came in to drink at sundown, were easily distinguished by their strange call, and were very shy.

CORACINA NOVAE-HOLLANDIAE MELANOPS, Gmelin  
(Black-faced Cuckoo-Shrike).

A common bird, often seen in the scrub, as well as in the open and along the water-courses. They seem to feed upon many berries as well as insects.

LALAGE TRICOLOR, Swainson  
(White-shouldered Caterpillar-eater).

Quite numbers of these birds were met with; sometimes a small party would be seen in close attendance upon flowering shrubs, where they preyed upon many flying insects attracted by the flowers. Although numbers came under observation, not one was seen in full breeding plumage. Had all the appearance of travelling south.

Family TIMELIIDAE.

CINCLOSOMA CASANOTUM DUNDASI, Mathews  
(Chestnut-backed Ground-Bird).

Only met with in the sandy country between the Everard Range and the Officer Creek. Fully-fledged young were taken in August, also eggs.

SAMUELA CINNAMONEA, Gould (Cinnamon Ground-Bird).

On the outward journey these birds were rather plentiful on the stony tablelands, but upon our return, in the same locality, not a bird was to be seen. I have never seen this bird in the sandhill country. It will be seen by Mr. Lea's examination of stomach contents that the birds are great seed-eaters.

MORGANORNIS SUPERCILIOSUS, Vigors and Horsfield  
(White-browed Babbler).

Very plentiful; enjoys a great range. Many specimens were taken of a dark-red colour, caused by bathing and then fluttering in the red dusty soil. Many nests were seen, some containing eggs, others young birds.

CALAMANTHUS CAMPESTRIS ISABELLINUS, North (Desert Wren).

Only met with at odd times amongst the saltbush up to Wantapella Swamp, but after entering the granite country they disappeared. Very shy and difficult to procure, passing from one bush to the other with great rapidity.

PTENOEDUS MATHEWSI VIGORSI, Mathews  
(Eastern Rufous Song-Lark).

One specimen taken at Wantapella Swamp. The bird was very silent.

Family TURDIDAE.

PAREPHTIANURA TRICOLOR, Gould (Tricoloured Chat).

Large flocks were met with, composed of birds in all stages of plumage. At the first part of the journey it was rare to

see a bird in full breeding plumage, but on the way back it was common to see such. They showed a preference for open scrub country. Had every appearance of migration, probably due to food supply.

AUREPTHIANURA AURIFRONS, Gould (Orange-fronted Chat).

Not so plentiful as the last species, and seems to prefer the open saltbush plains to bush land.

ASHBYIA LOVENSIS, Ashby (Desert Bush-Chat).

These birds are so like the Pipit in habits that they were taken for such until handled. They ran along in front of me, bobbing their tails up and down, giving forth a sharp note very like the warning note of the Pipit, but not quite so loud.

Family SYLVIIDAE.

ACANTHIZA PUSILLA CONSOBRINA, Mathews  
(Pale Red-rumped Tit).

Often met with, and seems to have a great range. It seems to show a preference for open scrub country, and possesses a lovely little song, not loud but very sweet.

ACANTHIZA MARIANAE,<sup>(5)</sup> S. A. White (Everard Range Tit).

After entering the granite country west of the Indulkana Range this new *Acanthiza* was met with. It was fairly plentiful in the thick mulga scrubs, which extend between the Everard and Musgrave Ranges. In some cases this was the only bird to be found in these dense, waterless solitudes. The dry, lifeless scrubs seem to affect these little birds, for not once did I hear them burst out into song; a feeble little chirrup seems to be their usual note, even at nesting time. It seems to spend most of its time hopping silently about amongst the lower branches of the mulga, which its colouration so resembles, peering behind every piece of bark and into every nook and corner in search of insects, moths, and spiders; the latter must be drink as well as food. Although the bird resembles *A. uropygialis condora* somewhat in size and colouration of under-surface, the bill of this new bird is thicker and is of quite a different shape, and the blue-grey of the upper-surface is unlike any other member of the genus in Australia. The upper-surface harmonizes so well with the bark of the mulga trees that it would be very difficult from overhead to pick this little bird out when sitting on the blue-grey bark of the mulga.

(5) White, S. A., South Australian Ornithologist, vol. ii., No. 2, 1915.

## ACANTHIZA UROPYGIALIS CONDORA, Mathews

(Pale Chestnut-Rumped Tit).

This was a common bird, found in nearly every situation. Very sprightly, moving about amongst the foliage of mulga, acacia, and other shrubs with great alertness, uttering a sharp little note, like chit, chit, chit, nearly all the time. When resting one or two will sit on a bough close to one another, and evidently the male birds break out at times into a short but melodious and soft song. I discovered a nest of this bird at Moorilyanna Native Well. It was placed in a stump six inches from the ground, and was composed of bark, grass, and cobwebs; lined with wallaby fur and feathers. The eggs were three in number, ground colour white, spotted with reddish-brown, more thickly at one end. This is the first nest taken of this species, and was described by H. L. White, of "Bell-trees," New South Wales, in the "Emu," vol. xv., part 1, p. 35, July, 1915.

## ACANTHIZA IREDALEI MORGANI, Mathews

(Southern Thin-billed Tit).

This is a very rare little bird, and was only seen on two occasions. Note and habits seem very like other members of the genus.

## GEOBASILEUS CHRYSORRHAUS ADDENDUS, Mathews

(Port Augusta Yellow-rumped Tit).

Met with in small parties, both in the Musgrave and Everard Ranges. When flying they were very conspicuous with their light-yellow breast and bright-yellow rumps. Skins taken agree well with those collected in the type locality; note does not differ from the coastal forms.

## PYRRHOLAEMUS BRUNNEUS, Gould (Red Throat).

In many localities it was numerous; showed a decided preference to the western or south-western slopes of ranges, where it kept very close to the low bushes. A great songster, and if not disturbed will mount to the top of a bush and pour forth song after song. Mr. Lea's examination of stomachs shows that this bird eats quite a quantity of seeds, which is certainly remarkable.

## MALURUS MELANOTUS CALLAINUS, Gould (Turquoise Wren).

Met with for the first time during the trip eighty miles west of Oodnadatta, after which it was seen in many localities, but not in any numbers. Upon comparison, I find that this

bird really comes between *M. callainus* and *M. whitei*, approaching the first-named more closely; yet the shade of blue on head and mantle does not agree with either.

HALLORNIS CYANOTUS, Gould (White-winged Wren).

This is a true saltbush bird, and is seldom seen away from it. A very wide distribution, but not numerous. Specimens taken show little or no variation.

DIAPHORILLAS TEXTILIS PURNELLI <sup>(6)</sup>

(Buff-throated Grass-Wren).

Very numerous amongst the porcupine grass growing on the foothills of the Musgrave and on the Everard Ranges. Found it very difficult to obtain specimen, for they kept so close to cover that they would allow themselves to be trampled on almost before making off. The female shows a great deal more rufous colouration on the flanks than the male. Their colouration harmonizes most wonderfully with the reddish-brown granite. Just before sundown the male bird will sit upon a bare rock and sing a sweet little twittering song, but at the slightest sound darts like a mouse to cover.

EYRAMYTIS, sp (?).

A bird of this genus was met with near Indulkanna Springs, which was taken at the time for *E. goyderi*, but since then Gould's plate of the latter bird having been examined it is easily seen that the skins in the Adelaide Museum labelled *E. goyderi* are not that bird, but agree fairly well with this doubtful species.

Family ARTAMIDAE.

CAMPBELLORNIS PERSONATUS MUNNA, Mathews

(Masked Wood-Swallow).

Several large flocks were met with travelling south in company with *C. superciliosus*.

CAMPBELLORNIS SUPERCILIOSUS, Gould

(White-browed Wood-Swallow).

Appeared to be travelling south with *C. p. munna*.

AUSTRARTAMUS MELANOPS (Black-faced Wood-Swallow).

Thinly scattered all over the country; not nearly so plentiful as further south.

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(6) Mathews, A. A. Record, vol. ii., No. 5, p. 99.



## Family PRIONOPIDAE.

COLLURICINCLA RUFIVENTRIS WHITEI, Mathews

(Southern Buff-bellied Shrike-Thrush).

Fairly plentiful near water. There seems little or no difference between this and the southern bird. A nest was observed in course of construction; it was composed of strips of bark and placed in a stump five feet from the ground.

GRALLINA CYANOLEUCA, Latham (Magpie Lark).

Observed once or twice at water-holes while travelling along the Alberga River, but did not again appear in the dry country.

## Family LANIIDAE.

CRATICUS NIGROGULARIS MELLORI, Mathews

(Southern Black-throated Butcher-Bird).

A few met with along the dry water-courses. Their beautiful carol was heard night and morning. A very early bird, and at times very noisy. Skins collected and compared with those from the central districts show no variation.

BULESTES TORQUATUS ETHELAE, Mathews

(Southern Butcher-Bird).

Very rare; only one or two seen.

OREOICA CRISTATA CLELANDI, Mathews (Crested Bell-Bird).

Found all through the country, but one could not say they were plentiful. One of their notes resembles the camel bell most wonderfully. Often to be seen searching over the ground for food, when they hop along rapidly, but when alarmed stand motionless, and are difficult to detect amidst their grey surroundings. They are wonderful ventriloquists.

## Family PARIDAE.

APHELOCEPHALA CASTANEIVENTRIS WHITEI,<sup>(7)</sup> Mathews

(Whiteface).

This subspecies, which we discovered the year previous to this expedition, was plentiful all through the country. Took a nest in the Everard Range, on August 8, 1914; it was composed of grass and twigs, lined with animal fur, and placed in a hollow mulga. The eggs were three in number, almost round, the ground-colour greyish-white, spotted all over with dark-red or purple markings. These are the first eggs taken of this subspecies, and were described by H. L. White, "Emu," vol. xv., part 1, p. 36.

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(7) A. A. Record, vol. ii., No. 5.

APHELOCEPHALA PECTORALIS, Gould  
(Chestnut-breasted Whiteface).

The rediscovery of this bird was a great surprise, John Gould having described it in 1871, and it had not been seen since. It was met with in small parties on the tablelands or gibber country, about fifty miles west of Oodnadatta, and continued to do so off and on till we entered the granite country west of the Indulkana Range, and this range may form the westerly limit. They were hopping about on stony ground in search of seeds. When alarmed they flew into a bush (if one was near), then off to some little distance to alight upon the ground, where they moved about very quickly. When on the wing they uttered a twittering note. A good series of species was collected—adult males and females, as well as immature birds. Rain having fallen lightly over a restricted area a few weeks prior to our visit, these birds had nested and brought up their young, having quite a number with them. In some cases the young birds had a few dark spots appearing on the faint buff band which crosses the breast.

APHELOCEPHALA NIGRICINCTA, North  
(Black-banded Whiteface).

Numbers of these birds were met with on the stony tablelands, often in company with *A. pectoralis*, and, like that bird, were not seen after entering the granite country, although *A. c. whitei* was plentiful everywhere.

SPHENOSTOMA CRISTATUM PALLIDUM, Mathews  
(Pale Wedgebill).

Scattered throughout the country visited; were met with in very dry localities. They move very rapidly over the ground in long hops, taking flight every little while to a low bush, and while on the wing invariably spread out the tail, and when they alight hop from branch very quickly with crest erected. Specimens taken near the Musgrave Ranges are very light in colouration.

Family SITTIDAE.

NEOSITTA PILEATA TENUIROSTRIS, Gould  
(Slender-billed Tree-runner).

Small parties were met with in the mulga scrubs, where they were searching for insects in the crevices and behind the trunks and branches. Specimens do not show any variation to birds found further south.

## Family CERTHIIDAE.

CLIMACTERIS ERYTHROPS SUPERCILIOSA, North  
(White-browed Tree-creeper).

Was not met with till sixty miles west of Oodnadatta, but after that it was plentiful in some localities. Generally met with in pairs, but no nests were seen.

## Family DICAÆIDAE.

AUSTRODICAÆUM HIRUNDINACEUM, Shaw and Nodder  
(Mistletoe Bird).

Very few of these little birds came under notice; this is no doubt due to the scarcity of the parasitic plant, *Lorenthus*.

PARDALOTINUS RUBRICATUS PALLIDUS, Campbell  
(Pale Red-browed Pardalote).

Met with on nearly all the dry water-courses along which red-gums grew. Their note is a double one, quickly repeated. Specimens collected are much paler in every respect to those taken the year before in the central regions.

PARDALOTINUS STRIATUS FINKEL,<sup>(8)</sup> Mathews  
(Central Australian Pardalote).

A few of these birds were met with amongst the gum-tree tops along the dry water-courses. On comparison with the skins taken in Central Australia, 1913, they agree in every respect.

## Family MELIPHAGIDAE.

GLICIPHILA ALBIFRONS, Gould (White-fronted Honey-eater).

Quite a number of these birds had congregated in several localities visited; this was due to the fuchsia bushes (*Fromophila*) being in full flower. They are very timid, and darted about amongst the bushes in a most erratic manner. The note is mournful and long-drawn.

CERTHIONYX VARIEGATUS, Lesson (Pied Honey-eater).

This rare honey-eater was first met with amongst the granite boulders at Moorilyanna Native Well, and attracted attention by its strange movements. Hopping on the ground round a mulga bush, it climbed up the stem after the manner of a parrot, till it was about two feet from the ground, when it hung head downwards for a minute or more; then it let go and fell to the ground, hopped round the bush, and again repeated the performance.

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(8) A. A. Record, vol. ii., No. 5.

MELIPHAGA SONORA, Gould (Singing Honey-eater).

A very common bird all over the country traversed. The large series of skins taken agrees well with the coastal form, yet the note of the interior bird is a very distinctive one, and not once did we hear any of the notes common to coastal birds. One of the most common calls of this interior bird is made when passing from one flowering tree or shrub to another, and sounds like "perisimo, perisimo," repeated many times, but none of the full, liquid, and sonorous notes we are so used to hearing in the south.

LICHENOSTOMUS KEARTLANDI, North  
(Grey-headed Honey-eater).

Met with in the Musgrave and Everard Ranges, where it was fairly plentiful. It possesses that erratic flight and manner so common to members of the same family. The note is rather feeble, the most common one being an alarm note, uttered many times, like "chit, chit, chit." Found fully-fledged young, with the parent birds, in the Everard Range. Upon comparing the birds with skins taken in the type locality I find that the birds from the Musgrave and Everard Ranges are much brighter, especially the yellow on the breast and throat.

LICHENOSTOMUS PLUMULUS ETHELAE, Mathews  
(Southern Yellow-fronted Honey-eater).

In some localities these birds were very numerous and are very like *P. ornata* in habits and call, many of the notes being the same at Wantapella Swamp. Young birds just away from the nest were met with, and their breasts were covered in a light-yellow down. I found this the case with nestlings a few days old.

PTILOTULA PENICILLATA LEILAVALENSIS, North  
(Cloncurry White-plumed Honey-eater).

The bird was found on all the dry water-courses and in the ranges where the red-gum was growing. Its habits and note seem identical with the southern form, *P. penicillata*. I feel very uncertain about this bird being the Cloncurry variety, for it shows a dark line alongside the white ear-covert, but not having seen North's type I am allowing it to appear as above.

MYZANTHA FLAVIGULA, Gould (Yellow-throated Miner).

A very common bird near all water, and, like other members of the genus, very noisy and restless. They have a habit of congregating in a party of a dozen or more on a limb,

all calling as loudly as they can; then one bird will fly off to another tree, and all will follow one after the other. The skins procured agree with those collected between Oodnadatta and the MacDonnell Ranges.

*ACANTHOGENYS RUFUGULARIS* CYGNUS, Mathews  
(Southern Spiny-cheeked Honey-eater).

Wherever we met with flowering trees and shrubs this bird was fairly plentiful. No difference can be detected between this and the southern bird.

Family MOTACILLIDAE.

*ANTHUS AUSTRALIS ADELAISENSIS*, Mathews (Southern Pipet).

These birds were often met with in pairs on the saltbush plains and open patches in the mulga. In one instance they were found breeding.

Family PLOCEIDAE.

*TAENIOPYGIA CASTANOTIS*, Gould (Chestnut-eared Finch).

These birds congregated night and morning in great numbers at some of the waters, and the ground under the bushes and around the watering-places was white with excreta of these finches.

*EMBLEMA PIETA ETHELAE*,<sup>(9)</sup> Mathews (Painted Finch).

This is a very rare and shy bird. Seen once or twice in the deep gorges of the Musgrave Ranges, and seemed to be feeding upon the seed of the porcupine grass.

Family COVIDAE.

*CORVUS CORONOIDES PERPLEXUS*, Mathews (Southern Raven).

Numbers of these birds were seen. They are very puzzling, for skins were collected with white basal half to feathers, while others had these black. The majority had white eye, a few having hazel or light-brown eyes.

*NEOSTREPERA VERSICOLOR PLUMBEA*, Gould  
(Leaden Crow-Shrike).

This is a record for this bird to be found in South Australia, but it is only an overlapping of a western form. Met with in the Musgrave and Everard Ranges, and was heard of on the Alberga River at Lambinna Soak. Not plentiful; very shy and wary. A pair was nesting in the Everard Range in August.

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(9) A. A. Record, vol. ii., No. 5.

## (e) STOMACH CONTENTS OF BIRDS.

By ARTHUR M. LEA, F.E.S., Museum Entomologist.

[*Contribution from the South Australian Museum.*]

The stomachs brought back by Captain White were nearly all of small birds, and many contained specimens of insects, or fragments of same, that certainly belong to undescribed species. Some of them contained amazing numbers of ants; in fact, ants appear to be the staple food of many Central Australian birds, and they bulk largely in most stomachs. Most of the seeds found in the stomachs were sent to Mr. J. H. Maiden (Government Botanist of New South Wales), and we have to thank him for all the botanical names given in brackets; these, he writes, were from determinations by his assistant (Mr. Carne).

In the following list only the technical names of the birds are given, the popular ones will be found in Captain White's own paper; they are in the same sequence:—

*Peltohyas australis*.—Two caterpillars; head and abdomen of small male ant; vegetable matter; many small pebbles.

*Cerchneis cenchroides*.<sup>(1)</sup>—Some fine grit.

*Neopsephotus bourkii*.—Crop—Distended with hundreds of small round seeds; a few larger seeds. Stomachs (1)—A few of the round seeds as in crop, and some fine grit. (2)—As first stomach.

*Cyanalcyon pyrrhopygius*.—Four lizards, or remnants of same (one *Lygosoma lesueurii*, two *Amphibolurus reticulatus*<sup>(2)</sup>).

*Heteroscenes pallidus*.—Two wingless grasshoppers (*Trigoniza*); two heads and other parts of another species of grasshopper; many other fragments of insects.

*Neochalcites basalis*.—Large hairy caterpillars; three small caterpillars; fragment of beetle; small amount of grit.

*Whiteornis goodenovii*.—(1)—Six caterpillars, fragments of scutellerid bug; fragments of small weevil (*Desiantha* [?]); small beetle (*Formicomus*); head of small ant (*Pheidole*, soldier); many other fragments of insects. (2)—Eleven caterpillars; chinch bug (*Nysius vinitor*); larva of ant-lion; bits of small weevils; head of meat-ant (*Iridomyrmex detectus*, var.

(1) In this stomach there were four nematode worms, one with its head buried in the stomach wall; they are evidently true stomach parasites, and the first I have ever seen from a bird, although in the intestines and elsewhere in many birds nematode and tapeworms are abundant.

(2) Identifications by Mr. F. R. Zietz.

*viridiaeneus*); ichneumon fly; head of small bee; many other fragments of insects. (3)—Twenty heads and other fragments of scutellerid plant bugs; head of small ant (*Pheidole*, soldier). (4)—Eleven caterpillars; bits of thin reed-bugs; bits of several species of small weevils. (5)—Heads of three jassid bugs; several plant bugs; bits of three spiders; many other fragments of insects.

*Melanodryas cucullata vigorsi*.—(1)—One large and six small caterpillars; bits of large wingless grasshopper; bits of weevil (*Polyphrades*); other fragments of insects. (2)—Seven caterpillars; bits of young grasshopper; numerous small weevils (*Titinia*) and bits of same; meat-ant (*Iridomyrmex detectus*); many other fragments of insects.

*Smicrornis brevirostris mathewsi*.—Head of minute chalcid wasp; many very minute fragments of insects.

*Lewinornis rufiventris maudeae*.—(1)—Small cockchafer beetle (*Liparetrus*); bits of longicorn beetle (*Symphyletes*); bits of meat ant (*Iridomyrmex detectus*, var. *viridiaeneus*); head of male ant: bits of plant bugs: many fragments of insects. (2)—Ichneumon fly; numerous small weevils (*Polyphrades*); bits of plant bugs; many fragments of insects.

*Leucorcirca tricolor*.—Common blow-fly and parts of two others; small fly; two carrion beetles (*Saprinus cyaneus*); two small jassid bugs; larval ground bug; small bit of ant.

*Pteropodoceys maxima*.—Remains of at least six species of grasshoppers; larva of mantis; larva of very small mantis (*Haania*); larva of walking-stick insect (*Cyphocrania cornuta*); of another species (*Bacteria* [?]); very young larva of another species; small pebble.

*Coracina novae-hollandiae melanops*.—(1)—Bits of two weevils (*Polyphrades*); several lerp scales; thirteen six-lobed yellow berries (*Loranthus exocarpi*); some slimy material, probably from berries; bits of leaves. (2)—Weevil (small *Oxyops*); bits of other weevils (probably *Gonipterus* and *Polyphrades*); eight subelliptic seeds (*Melothria maderaspatana* [?]).

*Samuela cinnamonea*.—(1)—Many small caterpillars; two brown seeds; one smaller brown seed; one still smaller brown seed; one black seed (*Portulaca oleracea*); hundreds of thin pale seeds (a grass); much small grit. (2)—Elytron and abdomen of carabid beetle; a few black seeds (*Portulaca oleracea*); many reddish-brown seeds (*Hibiscus*); very many small reddish seeds (*Setaria viridis*); much small grit. (3)—Head of small ant, long reddish seed (*Erodium cygnorum*); many curved brownish seeds (*Legume*); fourteen kidney-shaped seeds (*Caryophyllaceae* [?]); many small red seeds;

much small grit. (4)—Many of the three first kinds of seeds as in the third stomach; much small grit; no insect remains. (5)—Thorax of ant; many of the three first kinds of seeds as in the third stomach; three other seeds (*Hibiscus*); growing seed (?); much small grit. (6)—Many of the three first kinds of seeds as in the third stomach; four other kinds of seeds; much small grit; no insect remains.

*Morganornis superciliosus*.—(1)—Wattle beetle (*Calomela*); leaf-eating beetle (*Paropsis* of the *verrucosus* group); scutellerid plant bug; many minute fragments of beetles and of plant bugs. (2)—Nine caterpillars; six heads and many fragments of scutellerid plant bugs; fragments of *Paropsis* of *verrucosus* group; elytra of small leaf-eating beetle (*Ditropidus*); many other fragments of insects.

*Calamanthus campestris isabellinus*.—(1)—Small curious pirate bug; two heads of small ants (*Pheidole*, soldier); many minute fragments of insects; four curled black seeds (*Portulaca oleracea*); nine small yellowish seeds (*Setaria viridis*); many minute reddish seeds (*Caryophyllaceae* [?]); bit of grit. (2)—Young ground cricket (*Gryllus*); elytra of small carabid beetle; six heads of small ants (*Pheidole*, soldiers); sugar ant (*Camponotus*); falcis of spider; same kinds of seeds as in first stomach.

*Parephtianura tricolor*.—(1)—Crammed with minute reddish seeds (*Caryophyllaceae*); one small dark seed (*Panicum* [?]); small amount of grit; no insect remains. (2)—Twenty-seven small grubs; small flat seed (*Chenopodiaceae*); some small grit.

*Aurephtianura aurifrons*.—(1)—Forty-eight small caterpillars or heads of same; larval jassid bug; young grasshopper; elytron of small weevil. (2)—Eight small caterpillars; parts of at least thirty small weevils (probably all of genus *Polyphrades*). (3)—Heads of two ants (*Pheidole*, soldier, and probably male of same species); elytron of small ladybird (*Rhizobius* [?]); many small rough black seeds.

*Acanthiza marianae*.—Leaf-eating beetle (*Ditropidus*); large thrips (*Idolothrips spectrum*); head of small jassid bug; small chalcid wasp; part of cephalothorax of spider; many minute fragments of insects.

*Acanthiza uropygialis condora*.—(1)—Lace bug; wings, heads, etc., of male ants; two lerp scales; elytron of weevil; legs of spider; many other fragments of insects; four dark-brown seeds (*Portulaca oleracea*). (2)—Caterpillar; two leaf-eating beetles (*Ditropidus*) and bits of three others; bits of spiders. (3)—Four very young grasshoppers; bits of jassid bugs.



*Geobasileus chrysothorax addendus*.—(1)—Two caterpillars; elytra of small beetle (*Formicomus*); some minute fragments of insects. (2)—Four caterpillars; bits of weevil; larva of water bug; small jassid bug; many minute fragments of insects. (3)—Four caterpillars; small weevil (*Desiantha*); three small jassid bugs; many minute fragments of insects. (4)—Many small caterpillars; head of small scutellerid bug.

*Pyrrholaemus brunneus*.—(1)—Two small rat-tailed maggots; head of blow-fly; young grasshopper; head of minute weevil; two rough black seeds; many small curved seeds. (2)—Fragments of young grasshoppers; small caterpillar; head of male ant; head of small butterfly; dirty straw-coloured seed (*Setaria viridis*). (3)—Three caterpillars; bits of two small butterflies; many minute pale seeds (*Panicum effusum*); bits of two berries (*Enchylaena tomentosa* [?]). Many small caterpillars and one large one; remains of young grasshopper; heads of two small butterflies; larva of ant-lion<sup>(3)</sup>; many minute pale seeds (*Panicum effusum* [?]). (5)—Nine caterpillars; two small moths; head of small ant; bits of two small spiders; some fragments of insects; eleven ribbed brown seeds (*Scirpus*); three thin pale seeds (a grass). (6)—Many minute fragments, probably of small beetles and ants; some small grit; one small pale seed (*Panicum effusum* [?]).

*Malurus melanotus callainus*.—(1)—Caterpillar; sixteen small black ants and remnants of many others; many small black seeds (*Portulaca oleracea*); two slightly larger dark-brown seeds; small grit. (2)—Numerous fragments of two species of small ants (*Iridomyrmex*); small ant (*Meranoplus*); fragments of other genera of small ants; small stone-fly (*Neuroptera*); similar seeds to those of first stomach. (3)—Many fragments of small ants, mostly of genus *Iridomyrmex*; portion of head of larger ant; several small black seeds (*Portulaca oleracea*).

*Diaphorillas textilis purnelli*.—(1)—Bits of several species of ants, including *Ectatomma metallicum*; many minute fragments of insects; many brown seeds (*Hibiscus*); some small grit. (2)—Innumerable very minute fragments of insects (*Aphides* [?]); seven rounded blackish seeds; three curved black seeds (*Composite*); five thin reddish seeds (*Erodium cygnorum*); one pale seed similar in appearance to that of passion fruit; two rounded brownish seeds (*Melothria maderaspatana* [?]); one minute pale seed (*Setaria viridis*).

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(3) This is a most curious specimen; it is thickly covered with small clubbed hairs, suggestive of the sticky ones of Droseraceous plants. A similar larva was seen in a stomach of *Neopsitta pileata tenuirostris*.

(3)—Innumerable fragments as in first stomach; fragments of male ants; two small beetles near *Caedimorpha*; twenty triangular black seeds: two round blackish seeds; small grit.

*Eyramytis*, sp. [?].—Fragments of small weevil; many shining black seeds; many small reddish seeds (*Caryophyllaceae*); nine pale seeds (*Setaria viridis*); fine grit.

*Austrartamus melanops*.—Bits of carabid beetles (*Dicrochile goryi* and *Chlaenioidius herbaceus*); male of green-head ant (*Ectatomma metallicum*); soldiers and many workers of small ants (*Pheidole*); bits of sugar ant (*Camponotus*, soldier); head of small bee; bits of plant bugs; many other fragments, mostly of ants.

*Colluricincla rufiventris whitei*.—(1)—Seven caterpillars; three young grasshoppers; elytra of two weevils (*Polyphrades* [?]); legs of larger weevil (*Leptops* [?]); bits of plant bugs; many fragments of insects. (2)—Twelve caterpillars; grasshopper (*Choriphistes cyanopterus*); nine young grasshoppers or parts of same; fragments of land-shell.

*Oreoica cristata clelandi*.—(1)—Bit of elytron of longicorn beetle (*Symphyletes*); fragments of ants, of weevils, and of spiders; reddish seed (*Erodium cygnorum*); hundreds of thin straw-coloured seeds (grass); bits of berries (?). (2)—Several soldiers and workers of white ants; bits of many stinging ants (*Ectatomma* or allied genus); many fragments of insects; some vegetable matter; two buds of plants (?).

*Aphelocephala castaneiventris whitei*.—(1)—Large caterpillar; nineteen grain-like seeds and fragments of many others (*Setaria viridis*); small amount of grit. (2)—Minute fragments of weevils; many small grain-like seeds (*Setaria viridis*); two pale brownish seeds (*Caryophyllaceae*); three small reddish seeds (*Caryophyllaceae*); very fine grit.

*Aphelocephala pectoralis*.—(1)—Caterpillar; remains of many small weevils (*Polyphrades* [?]); three thin pale seeds (*Panicum*); many small rounded seeds; small grit. (2)—Bits of minute beetle (*Formicomus*); eight thin pale seeds (grass); one flat pale seed; many minute black seeds (*Portulaca oleracea*); many minute reddish seeds (*Setaria viridis*); one somewhat larger reddish seed (*Caryophyllaceae*); two granular black seeds; small grit. (3)—Fourteen small pale seeds (*Setaria viridis*); one very small reddish seed (*Caryophyllaceae*); eight thin pale seeds (*Panicum*); small grit; no insect remains. (4)—Bit of scutellerid bug; many small grain-like seeds; five smaller pale seeds; one small pale seed (*Portulaca oleracea*); one long reddish seed (*Erodium cygnorum*); small grit. (5)—Crammed with small pale seeds (*Caryophyllaceae*); slight amount of grit; no insect remains.

*Aphelocephala nigricincta*.—Bit of abdomen of ant; about twenty seeds of grass; many minute reddish seeds (*Setaria viridis*); small amount of grit.

*Sphenostoma cristatum pallidum*.—(1)—Stomach filled with small reddish seeds (*Caryophyllaceae*) and some fine grit; bits of legs of small plant bugs. (2)—Seeds and grit as in first stomach; no insect remains.

*Neositta pileata tenuirostris*.—(1)—Two caterpillars; larva of ant-lion; fragments of at least eighteen small weevils (*Xeda*). (2)—Young grasshopper (*Choryphistes*); twenty-three small weevils (*Xeda*) or fragments of same; legs of spider.

*Climacteris erythropis superciliosa*.—(1)—Numerous minute ants (*Iridomyrmex gracilis spurcus*); two heads of sugar ants (*Camponotus*); part of small weevil (*Polyphrades*). (2)—Very many minute ants (*I. g. spurcus*); numerous meat ants (*Iridomyrmex detectus*, var. *viridiaeneus*); head of ant (*Podomyrmex bimaculata*); bit of small weevil (*Polyphrades*); caterpillar. (3)—Over 500 minute ants (*I. g. spurcus*); many meat ants (*I. d. viridiaeneus*); head of small sugar ant (*Camponotus*).

*Pardalotinus rubricatus pallidus*.—(1)—Fragments of a fly (blowfly [?]); fragments of lerp scales. (2)—Small bee; two female thynnid wasps; bits of syrphus fly; remnants of lerp scales.

*Pardalotinus striatus funkei*.—Part of head of fly; bits of spiders; many fragments of insects.

*Gliciphila albifrons*.—Fragments of small bees and probably of other small *Hymenoptera*.

*Certhionyx variegatus*.—Over one hundred small caterpillars; wattle beetle (*Calomela*).

*Meliphaga sonora*.—Small ichneumon fly; many minute fragments, mostly of ants.

*Lichenostomus plumulus ethelae*.—(1)—Many fragments of very small bees; down-like feathers. (2)—Bits of small weevil (*Gerynassa* [?]); bit of small carabid beetle; head of jassid bug; small moth; small ichneumon fly; many minute fragments of insects. (3)—Bits of small and medium size ants; head of small bee; many fragments of insects. (4)—(Young bird). Ten caterpillars; three jassid bugs; young grasshopper; heads of blow-flies; lerp and several lerp scales; many spiders; many fragments of insects.

*Ptilotula penicillata leilavalensis*.—Two caterpillars; small moth; bits of small weevil (*Melanterius*); bits of two species of small ants; head of small male ant; fragment of coreid bug; many other fragments of insects.

*Myzantha flavigula*.—(1)—Small caterpillar; bits of weevil (*Gonipterus* or *Oxyops*); bits of leaf-eating beetle (*Paropsis* of the *verrucosus* group); head of ant; falcis of spider. (2)—Four caterpillars; two weevils (small *Oxyops*).

*Acanthogenys rufogularis cygnus*.—Many fragments of weevils (*Polyphrades* and *Titinia*); small jassid bugs; many other fragments of insects.

*Anthus australis adelaidensis*. — (1) — Two small weevils (*Titinia*) and fragments of many others: bits of a somewhat larger weevil (*Polyphrades*[?]); bits of a young grasshopper; fragments of plant bugs: some small grit. (2)—Twenty-six heads and many fragments of small ants (*Pheidole*, soldiers); several heads of small ants (*Iridomyrmex*); head of sugar ant (*Camponotus*, soldier); thorax and wings of male ant; young grasshopper; many fragments of insects; small flat seed (*Portulaca oleracea*). (3)—Two large caterpillars; one small one; two heads of small pirate bugs; other insect fragments. (4)—Two young grasshoppers; heads and fragments of many small weevils (*Titinia*); elytra of somewhat larger weevils (*Prosayleus*[?]); fragments of plant bugs; elongate black seed; small amount of grit.

*Neostrepera versicolor plumbea*.—(1)—Lizard (*Tympanocryptus lineata*<sup>(4)</sup>); three small ants (*Iridomyrmex nitidus*); fragments of amycterid weevil, of cockroach, and of spider. (2)—Fragments of amycterid weevil (*Sclerorhinus*); falcis and legs of spider; fragments of cockroach.

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(f) LACERTILIA.

By F. R. ZIETZ.

[*Contribution from the South Australian Museum.*]

The collection contains 130 specimens, comprising 19 species. Most of them are met with generally in the interior, and were previously recorded by the Elder and Horn Expeditions. Of special interest is the rediscovery of *Amphibolurus rufescens*, first collected by Mr. R. Helms on the Elder Expedition in 1891. Field notes by Captain White are appended and enclosed in brackets.

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(4) Identification by Mr. F. R. Zietz.

## GECKONIDAE.

CERAMODACTYLUS DAMAEUS, L. and F.

Between Everard and Indulkana Ranges; Wantapella Swamp.

HETERONOTA BYNOEI, Gray.

Moorilyanna Native Well; between Everard and Musgrave Ranges; Tablelands, 100 to 200 miles north-west of Oodnadatta. [Generally found under stones, sometimes under bark or logs.]

DIPLODACTYLUS CILIARIS, Boulgr.

Wantapella Swamp; from Musgrave Ranges to Moorilyanna Well; from Flat Rock Hole to Musgrave Ranges. [They were fairly numerous, and found under bark and in hollow branches of the mulga. When captured, they rubbed their tails against the hand and emitted a sticky and most objectionable smelling exudation from their caudal spines.]

GEHYRA VARIEGATA, D. and B.

Everard Range; Wantapella Swamp; from Musgrave Ranges to Moorilyanna Native Well. This appears to be one of the commonest species, twenty-six specimens having been collected. [Found under bark and stones, sometimes in hollow logs. Their colouration closely resembles that of their surroundings.]

## PYGOPODIDAE.

DELMA FRASERI, Gray.

Between Musgrave and Everard Ranges.

LIALIS BURTONII, Gray.

Indulkana, Everard Range.

## AGAMIDAE.

AMPHIBOLURUS MACULATUS, Gray.

Between Everard and Indulkana Ranges; Wantapella Swamp. [It is very quick in its movements, and is mostly found amongst the Porcupine grass. When basking in the sun its bright colouration is well shown, the black patch on the throat being very conspicuous.]

AMPHIBOLURUS RETICULATUS, Gray.

Musgrave and Everard Ranges; Wantapella Swamp. [Although thirty-two specimens of this lizard were captured,

it was not found to be so numerous as on my trip from Oodnadatta to the MacDonnell Ranges during the previous year. It burrows in the sand, and is often seen looking out of the burrow, evidently watching for prey. It is not so fleet as other members of this group, and often falls a victim to hawks.]

AMPHIBOLURUS RUFESCENS, S. and Z.

Three adult specimens of this little-known lizard were collected, two at the Everard Range and one at Wantapella Swamp. The type, an adult, and also two immature specimens, were taken by Mr. R. Helms on the Elder Exploring Expedition in 1891, <sup>(1)</sup> at Mount St. Thomas, Birksgate Range, about 100 miles west of the present record. Two of the recent specimens have complete tails, and thus enable me to give the correct caudal measurements, the tail in the type being incomplete. Unfortunately the largest specimen collected by Captain White also has a damaged tail, a portion of it being reproduced; it would have been much longer if uninjured. The number of femoral pores varies, but in all other respects these specimens agree with the type. To my knowledge only six examples are known to science, and they are contained in the South Australian Museum collection.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>Type</i>
Total length ... ..	245 mm.	282 mm.	265 mm.	228 mm.
Head ... ..	27 mm.	25 mm.	22 mm.	22 mm.
Body ... ..	70 mm.	67 mm.	56 mm.	66 mm.
Tail ... ..	148 mm. (incomplete)	190 mm.	187 mm.	140 mm. (incomplete)
Width of head .. ..	18 mm.	18 mm.	17 mm.	18 mm.
Front leg ... ..	38 mm.	38 mm.	36 mm.	35 mm.
Hind leg ... ..	84 mm.	80 mm.	76 mm.	78 mm.
Fem. and Preanal Pores	24 dex. 21 sin.	28 - 28	31 - 31	29 - 29

[This lizard was found on or near red granite rocks, and its colouration harmonizes wonderfully with its surroundings. It is such a fast runner that the only way to procure specimens was to shoot them. When running it carries its body erect, touching the ground with the hind feet only, and maintaining its balance with the long slender tail.]

(1) Proc. Roy. Soc., S.A., xvi., 1893. p. 164, pl. vi., figs. 2 and 2a.

*AMPHIBOLURUS BARBATUS*, Cuv.

Vaughan Hill; Everard Range.

*TYMPANOCRYPTIS LINEATA*, Peters.

Everard and Indulkana Ranges. [Found on the sandy plains and in mulga scrub, under stones and also in burrows, to which it retreats when danger threatens.]

*TYMPANOCRYPTIS CEPHALUS*, Günth.

Oodnadatta to Todmorden; Everard Range.

## VARANIDAE.

*VARANUS GILLENI*, L. and F.

Wantapella Swamp; between Everard and Musgrave Ranges.

## SCINCIDAE.

*EGERNIA WHITII*, Lacép.

Oodnadatta; Wantapella Swamp; Musgrave Ranges.

*HINULIA LESUEURII*, D. and B.

Everard and Musgrave Ranges.

*HINULIA FASCIOLATA*, Günth.

Everard Range; Wantapella Swamp.

*RHODONA GERRARDI*, Günth.

Musgrave Ranges to Mocrilyanna Native Well.

*RHODONA BIPES*, Fischer.

Tablelands 100 to 200 miles west of Oodnadatta.

*ABLEPHARUS LINEO-OCCELLATUS*, D. and B.

Moorilyanna Native Well to Everard Range.

## (g) MOLLUSCA (Pulmonata).

By A. R. RIDDLE.

Of the shells secured by Captain White, at least three species are represented. The writer is indebted to Dr. J. C. Verco for the opportunity of examining types and other specimens in both his own and the Museum collections, and also to Mr. C. Hedley, Assistant Curator and Conchologist to the Sydney Museum, for the opportunity of consulting the literature in that institution, as well as placing under contribution his own expert knowledge of Australian land shells.

## XANTHOMELON PERINFLATUM, Pfeiffer.

*Helix perinflata*, Pfeiffer: P.Z.S., 1863, p. 528.

*Xanthomelon perinflatum*, Hedley: Rpt. Horn Sc. Exp. to Cent. Aust., 1896, pt. ii., p. 224.

The specimens obtained comprise both live and dead shells. The live shells show but very faintly the broad rufous band, just above the periphery, which was a marked feature in many of the Elder Expedition shells. <sup>(1)</sup>

Captain White writes:—"The dead and bleached shells of this species were very numerous all through the country, between Moorilyanna Native Well and the Musgrave and Everard Ranges, more especially on the rising ground near those ranges. Where the shells occurred in large numbers quantities of leaves and dried herbage were found among them, which suggests that during good seasons a creeping herbage covers the ground into which the snails make their way. Live shells were taken in Glen Ferdinand (Musgrave Ranges) and in the Everard Range. In both cases they were found sealed with the epiphragm, lying under debris in creek beds. This shell, no doubt, provides an article of food for the natives, as large quantities were found heaped up near the remains of old fires. This species is also collected in great numbers by the Bower-bird (*Chlamydera maculata macdonnelli*) in the Everard Range, and is found heaped up at the entrance to their play-houses."

Among the shells is a single immature specimen, the identification of which is somewhat uncertain. It shows a close likeness to the immature shells in a series of *X. perinflatum* in the Adelaide Museum collections, but the slight callus on the columella is brownish.

Bednall, <sup>(2)</sup> in the Elder Expedition results, gives an account, under *Helix perinflata*, of some dwarf shells resembling *H. flindersi*, but lacking the colour-band of that species.

(1) *Vide* Bednall: Trans. Roy. Soc., S.A., vol. xvi., p. 62.

(2) *Loc. cit.*, *supra*.



"The shell is of a uniform greenish hue, with a shining vitreous appearance." This description fits the present specimen very well.

The specimen was taken with *Xanthomelon adcockianum* and *Chloritis squamulosa*.

#### XANTHOMELON ADCOCKIANUM, Bednall.

*Hadra adcockiana*, Bednall: 1894, Trans. Roy. Soc., S.A., vol. xviii., p. 190.

*Xanthomelon adcockiana*, Hedley: 1896, Rpt. Horn Sc. Exp., pt. ii., p. 224.

The writer proposes to place under this head three somewhat immature shells taken with *Chloritis squamulosa*. They agree almost entirely with Tate's "*Forma typica*,"<sup>(3)</sup> one of the three groups into which he subdivided this species. Probably the immaturity of the present shells accounts for the slight differences. Compared with the Adelaide Museum specimens, determined by Mr. Bednall, they agree well, although they are slightly more elevated. They have not, however, the height of *X. everardensis*. In common with the Museum specimens, they are of light-yellow to yellowish-green colour, with well-defined narrow fuscous bands. The type, however, was opaque-white with fuscous bands.

They were taken at Mocrilyanna Native Well, under native fig trees (*Ficus platypoda*).

Captain White writes:—"Great quantities of fallen leaves and fruit had collected between the rocks, and it was under this debris that the shells were taken."

#### CHLORITIS SQUAMULOSA, Tate.

*Hadra squamulosa*, Tate: 1894, Trans. Roy. Soc., S.A., vol. xviii., p. 193.

*Chloritis squamulosa*, Tate: 1896, Rpt. Horn Sc. Exp., pt. ii., p. 193, pl. xviii., fig. 10.

*Xanthomelon squamulosa*, Hedley: 1896, Rpt. Horn Sc. Exp., pt. ii., p. 225.

One live specimen only was obtained with the *X. adcockianum*. The shell is larger than the type, and measures 17 mm. (greatest diameter) by 9 mm. (height). The reference of this species to *Xanthomelon* in 1896, by Mr. Hedley, was done on the evidence derived from an imperfect dissection sent by Prof. Tate. In a recent communication, Mr. Hedley states his preference for *Chloritis*, and mentions the possibility of an error having been made in the labelling of the dissection in question.

(3) *Vide* Tate: Rpt. Horn Sc. Exp., pt. ii., p. 198.

## (h) ARACHNIDA.

By W. J. RAINBOW, Entomologist to the Australian Museum,  
Sydney.

## PLATES LXVII. AND LXVIII.

At the request of Captain S. A. White I have examined a collection of Arachnida made by him during an expedition to Central Australia. Naturally, the collection—small though it be—contains some novelties; and descriptions of, and notes upon, these will appear in the following pages of this paper. Some of the forms collected, of course, call for no special comment. Very little has hitherto been made known by naturalists of the Arachnid fauna of the interior of this continent; but this is not much to be wondered at when we consider the arid nature of the country and the difficulties and hardships of travel.

In 1896 Mr. H. R. Hogg, M.A., worked out the *Araneidae* of the Horn Exploring Expedition in the "Report of the Work of the Horn Scientific Exploring Expedition to Central Australia, Part ii., Zoology"; later, Embrik Strand, in "Zoologischen Jahrbüchern," 1913, contributed an interesting addition to our knowledge of this branch of our endemic fauna—a paper in which he not only recorded some species already described, but gave descriptions of forms new to science; finally, in 1914, my esteemed friend, Dr. R. H. Pulleine, of Adelaide, in the "Transactions of the Royal Society of South Australia," vol. xxxviii., published a brief list of a small collection of *Araneidae* made by Captain S. A. White. Each of the papers referred to above are of value, inasmuch as they extend our knowledge of range and distribution. Some of the species enumerated by these authors are also recorded below, as they form part of the collection submitted to me; but in addition to these some new genera and species are defined. The new material includes some particularly interesting forms, such as *Aganippe whitei*, in the *Avicularidae*; *Argyrodes binotata*, in the *Theridiidae*; two species of *Argiopidae*, for which I propose the names of *Dolophones intricata* and *D. thomisoides*; and two *Thomisidae*—*Timarus punctatus* and *Diaea pulleinei*.

Of great interest is the announcement of the occurrence of the family *Prodidomidae* in Australia. The species referred to, while being a true *Prodidomid*, renders the creation of two subfamilies, as well as that of a new genus and species, necessary, and fuller details of this interesting fact will be found a little further on in this paper. Another interesting species,

and one that I propose to call *Lycosa nigropunctata*, was also collected by Captain White. This is one of those *Lycosids*, the females of which make a lid or trap-door to their burrows. Finally, I record a new genus and species of the family *Oxyopidae*, for which I propose the name *Pseudohostus squamosus*, and to the notes upon this I refer the student. In the following pages there are enumerated two scorpions and twenty-nine spiders, and of these latter eleven are recorded as new, whilst one is the description of what I take to be the male of a previously known species—*viz.*, *Echemus griseus*, L. Koch. Two new subfamilies and two new genera are also defined.

Some of the material obtained by Captain White was too immature to be of value, but this is always so in collections of this branch of the fauna, and some were damaged. This latter contingency, as pointed out by Dr. Pulleine in his paper already referred to, could not possibly be avoided, owing to the softness of the animals' bodies, the roughness of the country over which they had to be conveyed, and the manner of their transport.

#### Suborder SCORPIONIDAE.

##### Family BUTHIDAE.

##### ISOMETROIDES (?) VESCUS, Karsh.

*Isometrus vescus*, Karsh: Schrift. der Ges. nat. Freunde, 1880, p. 56.

*Isometroides vescus*, Karsh: Keys, in Die Arach. des Aust., Suppl., 1884, p. 17, pl. ii., fig. 3.

*Hab.*—Everard Range to Wantapella Swamp.

*Note.*—Karsh's paper is inaccessible to me, but Keserling gives a lengthy description and a figure in his supplement to Ludwig Koch's monumental work. Unfortunately the latter author's specimen (which is in the collection of the University of Berlin, and is vaguely labelled "Australie") was damaged, for the writer says:—"Sturnum und Kämme fehlen leider dem vorliegenden Exemplare." Consequently I must let Captain White's specimen (of which only one example was taken) remain for the present as quoted above. *I. vescus* is the type of the genus.

##### Family SCORPIONIDAE.

##### URODACUS WOODWARDI, Poc.

Ann. Mag. Nat. Hist. (6), xii., 1893, p. 322, pl. xiv., figs. 8 and 9; *op. cit.* (7), ii., 1898, p. 63.

*Hab.*—Musgrave Ranges and Oodnadatta to Todmorden; originally recorded from the Darling Range, Western Australia.

## Suborder ARANEIDAE.

## Family AVICULARIDAE.

The collection contains only one trap-door spider, and this I have named *Aganippe whitei*, in honour of Captain White, the collector. The genus *Aganippe*, O. P. Cambr., is exclusively Australian, and the form described below makes the seventh species known to naturalists.

## AGANIPPE WHITEI, n. sp.

Pl. lxvii., figs. 1 and 2.

♀. Cephalothorax (not including *falces*), 8.5 mm. long, 6 mm. broad; abdomen, 13.4 mm. long, 7.5 mm. broad.

*Cephalothorax* yellow-brown, smooth, shining. *Pars cephalica* arched, raised, sloping backwards to thoracic fovea; sides darker than summit; a few scattered, short, bristly hairs are distributed over the surface, in addition to which there are also two or three long ones at rear of eyes; running down the middle there is a finely pencilled dark line, upon which are a few short adpressed black hairs, and this line is bifurcated in front; *ocular area* broader than long; immediately in front of *caput*, and between the front eyes, there is a group of long, coarse, black bristles (fig. 1); *clypeus* broad, pallid, indented at middle. *Pars thoracica* arched, broad; *thoracic fovea* deep, procurved; *marginal band* broad, pallid, fringed with short dark hairs. *Eyes* in three series of (reading from the front) 2, 2, 4; the two front eyes and lateral eyes of rear row large and of equal size: anterior median eyes considerably smaller, while the posterior median pair are minute; anterior eyes separated from each other by a space equal to once their individual diameter, and the front median pair from each other by a space equal to about one-half their individual diameter; posterior median eyes widely separated from each other (fig. 1). *Legs* concolorous with cephalothorax short, tapering; third and fourth pairs strongest; *tarsi* of first and second pairs scopulated; each leg densely clothed with long coarse hairs, and armed with strong black spines; superior claws long and serrated; inferior claw minute. Relative lengths, 4, 1, 2, 3. *Palpi* long, similar in colour, clothing, and armature to legs; *tarsi* scopulated. *Falces* rather darker than cephalothorax, porrected, arched, clothed with coarse hairs or bristles, and each furnished with a *rastellum*; outer angle of the furrow of each falx armed with ten strong teeth and the inner angle with eight; intermediately between these two rows there are, at the base, three small teeth (fig. 2); *fang* long, shining, almost black, well curved. *Marillae* reddish-brown, hairy, apices widely divergent; inner angles fringed

with long yellowish hairs. *Labium* concolorous, arched, hairy, broader than long, submerged. *Sternum* yellow-brown, pyriform, narrowest in front, arched, clothed with long coarse bristles; *sigilla* moderately large, removed from margin, not distinct. *Abdomen* elongate, somewhat obovate, yellow-brown, faintly mottled, pilose, and furnished with a few adpressed bristles on upper surface; a distinctly visible yellowish tapering line or bar runs down the middle, and this median line is broadest in front; towards anterior extremity of this bar there is on each side a large but faintly-defined round spot; near posterior extremity there are four pairs of short, faintly distinguishable lateral transverse bars, and these are directed downwards, each pair describing a chevron broken at the centre; at anterior extremities the abdomen is somewhat darker in colour; inferior surface pilose, dull yellow, clouded with somewhat darker patches. *Spinnerets* short, yellowish, hairy; superior mammillae stout, first joint as long as second and third combined; third joint minute, dome-shaped; inferior mammillae very short and separated from each other by a space equal to about once their individual length.

*Hab.*—Between Musgrave and Everard Ranges.

#### Family DICTYNIDAE.

##### AMAUROBIUS ROBUSTUS, L. Koch.

Die Arach. des Austr., i., 1872, p. 331, pl. xxxvi., figs. 5 and 5a.

*Hab.*—Wantapella Swamp, South Australia. Ranges from Northern Queensland to Western Australia.

*Note.*—*A. robustus* is evidently a variable species, which one would naturally expect from its being so common and so widely distributed. During the last twenty-five years I have examined very many specimens, but cannot recall one which did not differ in abdominal ornamentation from Koch's figure. Captain White's specimen shows (when in alcohol) distinct chevrons.

#### Family PRODIDOMIDAE.

One of the most interesting specimens collected by Captain White is a species which I take to be representative of the above family. This family is a very small one, and its range, according to Simon,<sup>(1)</sup> is as follows:—

*Prodidomus*, Hentz.: "Regio mediterranea calid., Hispania merid., Barbaria, Egyptus et Syria; Africa austr.; Arabia

(1) Simon: Hist. Nat. des Araign., i., 1892 (1893), pp. 337 and 338.

merid.; India orient.; Nova-Caledonia; America sept. et merid.; Venezuela."

*Eleleis*, Simon: "Africa max. australis."

*Zimiris*, Simon: "Arabia merid.; India; et fortasse Malaisia."

In the "Proceedings of the Californian Academy of Sciences," 3rd series, i., No. 7, 1898, p. 225, Nathan Banks described a Mexican species, for which he proposed the name *Zimiris pubescens*. This Simons considers to be the type of another genus, to which he gave the MS. name *Neozimiris*.<sup>(2)</sup>

Taking into consideration the distribution of the family as thus defined, it is only natural to suppose the possibility of its occurring in Australia. The form described below differs essentially from any of the species recorded to the genera above quoted. If my determination as to its systematic position be correct, then, for the convenience of classification, two subfamilies will have to be created, as well as a new genus. For the reception of the genera above quoted I propose the subfamily *Prodidominae*, and for the genus hereunder described *Cryptoerithinae*.

In speaking of the *Prodidomidae*, Professor Comstock says<sup>(3)</sup>:—"The *prodidomids* are two-clawed, eight-eyed spiders, with dissimilar eyes in three rows, and very robust chelicerae, which are furnished with very long and slender claws" [fangs.—W.J.R.]. The species described below, while displaying these points in the main, presents certain features widely distinct. In all *Prodidomids* hitherto known the eyes are arranged in three rows, reading from the front of 4, 2, 2, while in the species now under study, and for which I propose the name *Cryptoerithus occultus*, the formula is 2, 4, 2. Another point of interest is that instead of six spinnerets there are only four, of which two are extremely minute, and are ensconced in a deep pit or depression at the posterior extremity of the abdomen, and two very long, cylindrical ones situated on the underside, and at some little distance from the extremity. The latter pair are placed close together and almost touch each other; the minute pair, on the other hand, are decidedly difficult to trace, and this difficulty is increased owing to the abundance of comparatively long hairs within the cavity, and which surround them. In outline the cephalothorax is somewhat like *Eleleis*, Sim.

Simon, in his monumental work,<sup>(4)</sup> gives a lucid outline of the *Prodidomidae*, and to this the student is directed. I

(2) Simon: *op. cit.*, ii., 1897 (1903), p. 984.

(3) Comstock: "The Spider Book," 1912, p. 308.

(4) Simon: *op. cit.*, pp. 332-336.

give herewith a few points defining the two subfamilies as I understand them:—

*Cephalothorax* oval, obtuse in front, obtusely truncated at rear, and having a small median hollow depression; *ocular area* longer than broad. *Eyes*, eight; in three rows of 4, 2, 2. *Legs*: in *Prodidomus* and *Eleleis*, short; in *Zimiris*, the metatarsi and tarsi scopulated. *Falces* robust, convex at base; apices attenuated and divergent. *Labium* free, short, flat, apex attenuated, obtuse or truncated. *Sternum* flat, broadly oval, anterior angle rounded, posterior extremity acuminate, and terminating between fourth pair of coxae. *Abdomen* oval. *Spinnerets*, six ... ..

PRODIDOMINAE

*Cephalothorax* obovate, obtuse in front; *ocular area* longer than broad; *median fovea* elongate, and having the appearance of a sharp deep cut. *Eyes*, eight; in three rows of 2, 4, 2. *Falces* moderately long, robust; *fang* long. *Legs* long. *Maxillae* robust, arched, apices obtuse and inclining inwards, acuminate, rounded at heel. *Labium* free, rather longer than broad, acuminate, coniform. *Sternum* somewhat cordiform, anterior extremity acuminate, and terminating between fourth pair of coxae. *Abdomen* oval. *Spinnerets*, four; superior pair minute, and located within a deep recess or pit at posterior extremity of abdomen; inferior mammillae very long, cylindrical, two-jointed, basal joint minute ... ..

CRYPTOERITHINAE

Subfamily CRYPTOERITHINAE, n. subf.

CRYPTOERITHUS,<sup>(5)</sup> n. g.

Pl. lxvii., figs. 3, 4, and 5.

*Cephalothorax* obovate, arched, anterior extremity obtuse, narrow, posterior extremity truncated. *Pars cephalica* not raised; *ocular area* longer than broad. *Pars thoracica* broad, radial grooves not distinct; *median fovea* a longitudinal slit. *Eyes*, eight, arranged in three rows of 2, 4, 2 (fig. 3). *Legs* long, tapering, hairy, bespined. Relative lengths, 4, 1, 2, 3. *Palpi* moderately long. *Falces* moderately robust and moderately long; *fang* long. *Maxillae* not long, robust, arched, apices obtuse and inclining inwards. *Labium* free, short, slightly arched, apex acuminate, rather longer than broad, coniform. *Sternum* large, broad, slightly arched, somewhat cordiform, anterior angle rounded, posterior extremity acuminate and terminating between posterior coxae,

<sup>(5)</sup> κρυπτω = to hide; ἑριθος = a spinner.

which latter are much longer than their neighbours. *Abdomen* oval. *Spinnerets*, four. Superior pair minute and located in a deep posterior abdominal depression; inferior pair long, cylindrical.

CRYPTOERITHUS OCCULTUS, n. sp.

♀. Cephalothorax, 1.5 mm. long, 1.2 mm. broad; abdomen, 2.5 mm. broad, 1.6 mm. long.

*Cephalothorax* yellow, obovate, arched, moderately clothed with long black hairs. *Pars cephalica* sloping forward, not higher than thoracic segment, obtuse in front, arched, segmental groove faintly distinct; *ocular area* broader than long; *clypeus* not deep. *Pars thoracica* broad, convex, sloping sharply to the rear, posterior angle truncated and indented; *median fovea* elongate, and having the appearance of a sharp, deep cut; *marginal band* narrow, thickly fringed with short black hairs (fig. 3). *Eyes*, eight; arranged in three rows of 2, 4, 2; large, compactly grouped; median pair (second row) slightly the largest of the series; anterior eyes separated from each other by a space equal to about twice their individual diameter; second row slightly recurved; of this row the median eyes are separated from each other by a space equal to about half their individual diameter; lateral eyes are seated close to their inner neighbours, but do not touch; posterior pair wedge-shaped, obliquely placed, the points nearly meeting (fig. 3). *Legs* concolorous with cephalothorax, long, tapering, hairy, armed with moderately long and short strong spines; fourth pair of coxae much the longest; *tarsi* two-clawed; claws small and obscured by tufts of spatulate hairs. Relative lengths, 1, 4, 2, 3. *Palpi* concolorous with legs, moderately long, and similar in clothing and armature. *Falces* concolorous with palpi, moderately robust, tapering, arched, hairy; *fang* long. *Maxillae* pale yellow, almost white, arched, obtusely acuminate, bulging at base, apices inclining inwards and fringed with pale hairs; heel rounded; a few long, stiff bristles distributed over the surface. *Labium* concolorous with maxillae, rather longer than broad, free, slightly arched, apex obtuse; a few stiff, bristly hairs present. *Sternum* somewhat cordate, concolorous with labium, arched, anterior angle curved, posterior extremity acuminate and terminating between fourth pair of coxae; a few long, dark bristles spread over surface; margin reddish-brown; in front of each coxa there is a deep, lateral groove, extending well inwards and concolorous with margin. *Abdomen* oval, overhanging base of cephalothorax, strongly arched, yellow, clothed with short, sooty, adpressed hairs; posterior extremity deeply indented (fig. 4). *Epigynum* a transverse plaque with two transversely oval pits (fig. 5). *Spinnerets*, four; superior mammillae



minute, surrounded by dark, coarse hairs, and concealed within a deep recess or pit at posterior extremity of abdomen; inferior mammillae placed closely together, long, cylindrical, hairy, apices obliquely truncate (fig. 4).

*Hab.*—Flat Rock Hole, Musgrave Ranges, July 13, 1914.

Family DRASSIDAE.

ECHEMUS (?), Sim.

*Hemicloea longipes*, Hogg: Rep. Horn Expl. Exped., ii., Zool., 1896, p. 337.

Two specimens of what appear to be examples of this genus are included in the collection—one, an immature female, and which it is not possible to determine specifically with safety; and the other a mature male. Both examples are from the same locality, and may possibly be one and the same species. Only two forms of *Echemus* (?) have been described from Australia, viz., *E.* (?) (*Drassus*) *dilutus*, L. Koch, from Rockhampton, Northern Queensland, and *E.* (?) (*D.*) *griseus*, L. Koch., "Neuholland." Both of these were females, and the first-named was immature. In the absence of an adult female, one cannot say with exactitude whether the mature male in this collection is a new species or whether it may not be the unknown male form of *E.* (*D.*) *griseus*, but to that species for the present I associate it, and hereunder give a description.

*Hab.*—Everard Range.

ECHEMUS (?) (DRASSUS) (?) GRISEUS, L. Koch.

Pl. lxvii., fig. 6.

*Drassus griseus*, L. Koch: Die Arach. des Aust., i., 1873, p. 391, pl. xxx., fig. 8.

♂. Cephalothorax, 3·5 mm. long, 2·5 mm. broad; abdomen, 4 mm. long, 2 mm. broad.

*Cephalothorax* ovate, yellow, shining, smooth, arched. *Pars cephalica* sloping forward, obtuse in front, moderately clothed with fine hoary hairs; thoracic segment very faintly defined; *ocular area* broader than long, space between eyes dark-brown; *clypeus* narrow, deep, and fringed with pale hairs. *Pars thoracica* highest at *median fovea*, which latter is a long, deep, narrow cleft, and very distinct, no radial grooves present, posterior angle indented, surface moderately clothed with fine silky hairs; *marginal band* rather broad, fringed with long fine hairs. *Eyes* large, arranged in two rows of four each; both rows strongly recurved, the rear especially so; anterior median eyes dark, all others of a pearl-grey lustre; rear median eyes largest of the group, elliptical, seated obliquely, their rear extremities almost touching. *Legs* concolorous with

cephalothorax, long, tapering, clothed with fine hairs and armed with strong spines. *Palpi* moderately long, similar in colour and clothing to legs, heavily spined; *genital bulb* well developed, complicated (fig. 6). *Falces* concolorous with cephalothorax, moderately strong, arched, tapering, hairy; outer angle of the furrow of each falx armed with two large teeth and one small one, and the inner angle with two large teeth; *fang* short, well curved. *Maxillae* concolorous with falces, long, arched, apices obliquely truncated and inclined inwards; inner angle of apices white, heel rounded; a number of coarse black bristles spread over surface. *Labium* yellow, angles and apex white, arched; apex truncated and slightly concave at middle; surface similar in clothing to maxillae. *Sternum* pyriform, yellow, anterior angle rounded, apex acuminate and terminating between fourth pair of coxae, arched and clothed with coarse black bristles. *Abdomen* elliptical, slightly overhanging base of cephalothorax, arched, yellow, clothed with black hairs. *Spinnerets* yellow, elongate, cylindrical, grouped closely together; hairy.

*Hab.*—Moorilyanna Native Well, July 2, 1914.

#### LAMPONA PUNCTIGERA, Simon.

Die Fauna Sud-west Aust., i., 1908, p. 399.

*Hab.*—Moorilyanna Native Well, July 2, 1914. Widely distributed in Northern Australia.

#### Family ZODARIIDAE.

##### STORENA FORMOSA, Thor.

Oefv. Kongl. Vet. Akad., Förh., 1870, n. 4, p. 374; L. Koch: Die Arach. des Aust., i., 1872, p. 314, pl. xxv., fig 5.

*Hab.*—One mature female from ninety miles west of Todhunter, July 8, 1914; and one immature female from under bark, Flat Rock Hole, Musgrave Ranges. A widely distributed species.

#### Family THERIDIIDAE.

##### ARGYRODES, Sim.

Only one species of this family was collected, and that the male of an undescribed *Argyrodes*. In my "Census of Australian Arancidae"<sup>(6)</sup> only three species were recorded; since then I have described another,<sup>(7)</sup> while at the present moment several distinct forms are in my hands and are awaiting publication.

The specimen obtained by Captain White is an exceedingly small one, but very distinctly marked, and may be easily

(6) Rainbow: Rec. Aust. Mus., ix., No. 2, 1911, p. 155.

(7) Rainbow: Mem. Queens. Mus., i., 1912, p. 193, figs. 3 and 4.

picked out from its congeners by its ovate abdomen, which latter in most species is gibbous; this part of the body is yellowish-brown and ornamented by two reticulated silvery spots.

ARGYRODES BINOTATA, n. sp.

Pl. lxvii., figs. 7 and 8.

♂. Cephalothorax, 1 mm. long, 0·7 mm. broad; abdomen, 1·5 mm. long, 0·7 mm. broad.

*Cephalothorax* shining, ovate. *Pars cephalica* dark brown, arched, high, retreating rearwards, sides declivous; *ocular area* broader than long; *clypeus* produced, slightly cleft. *Pars thoracica* arched, dark brown in front, yellowish behind, radial grooves present; *marginal band* narrow. *Eyes* equal in size; distribution normal. *Legs* moderately long and moderately strong, tapering; femur of leg 3 dark-brown, but in legs 1, 2, and 4 white; metatarsi and tarsi yellow; each limb pilose and armed with fine spines. Relative lengths, 1, 4, 2, 3. *Palpi* short, strong, pilose, yellow-brown; genital bulb large, well developed, complicated (fig. 7). *Falces* concolorous with *pars cephalica*, arched, pubescent. *Maxillae* and *labium* concolorous with *falces*: normal. *Sternum* concolorous with foregoing, elongate, triangular, arched. *Abdomen* ovate, overhanging base of cephalothorax, arched, pubescent, yellowish-brown, upper-surface ornamented by two large, irregularly shaped, reticulated silvery spots (fig. 8).

*Hab.*—Everard Range, August 14, 1914.

Family ARGIOPIDAE.

NEPHILA EREMIANA, Hogg.

Rep. Horn Expl. Exped., ii., Zoology, 1896, p. 318, pl. xxiv., fig. 3.

*Hab.*—Female examples, ranging in development from immature to mature, were collected at the following localities:—Ninety miles west of Todmorden, July 8, 1914; Flat Rock Hole, Everard Range, July 22, 1914; and (no date recorded) between Oodnadatta and Todmorden.

DOLOPHONES, Walk.

Two distinct species of this genus were obtained, the first being represented by two examples, of which one is adult and the other immature, whilst the second species is represented by three specimens, none of which have reached the adult stage. Both species are of striking appearance, and each is undescribed. The spiders of this genus are noted for their flattened abdomen, which latter are always more or less

intricately marked. Conspicuous in the abdominal markings or ornamentation of the species are a varying number of cicatrose depressions or pits, and in the two forms now under review this feature is, as usual, most marked. For one of these new forms I propose the name *Dolophones intricata*, in allusion to its intricate ornamentation, and for the other, which displays a remarkable but superficial resemblance to certain *Thomisidae*, I propose the name *D. thomisoides*.

DOLOPHONES INTRICATA, n. sp.

Pl. lxvii., figs. 9 and 10. .

♀. Cephalothorax, 3.4 mm. long, 3.6 mm. broad; abdomen, 5.1 mm. long, 8.1 mm. broad (fig. 9).

*Cephalothorax* broadly ovate, much broader than long, dark brown generally, pilose, posterior extremity yellowish. *Pars cephalica* arched, truncated, recurved in front, broad, segmental groove distinct, a few short, fine hoary hairs spread over surface; *ocular area* broader than long; *clypeus* broad, not deep. *Pars thoracica* broad, strongly arched, radial grooves indistinct, a few hoary hairs spread over surface; *marginal band* broad, pilose, yellowish. *Eyes* normal. *Legs* moderately long, strong, tapering, dark brown with yellowish markings, pilose, armed with numerous long, strong spines. Relative lengths, 4, 1, 2, 3. *Palpi* short, strong, tapering, similar in colour, clothing, and armature to legs. *Falces* short, strong, arched, hairy, yellow at base and for about one-half their length thence, dark brown. *Maxillae* normal, outer angles and base yellowish, inner angles and apices pallid. *Labium* normal; apex pallid, the remainder yellow. *Sternum* oval, yellow, slightly arched. *Abdomen* overhanging base of cephalothorax, transversely oval, pilose, upper-surface convex, anterior angle truncated, wavy in outline, posterior extremity obtuse; general colour dark brown, with yellowish markings and cicatrose depressions; scheme of ornamentation intricate; inferior surface concave, grey, corrugated, corrugations lateral. *Epigynum* broad, with deep lateral pits, between which there is a long, convex, spatulate process (fig. 10).

*Hab.*—Oodnadatta to Todmorden (no date), and Car-meena, Everard Range, August 14, 1914.

DOLOPHONES THOMISOIDES, n. sp.

Pl. lxviii., fig. 11.

The description which I give hereunder is drawn from the oldest and largest of the three examples collected, and which is apparently almost adult. Personally I avoid describing immature forms as a rule, but there are times when one may

with propriety depart from a set custom, and the present instance is, to my mind, a case in which such a departure is justified. The laterigrade grouping of the legs and the general appearance of the *caput* and *falces* are the main points that suggest a *Thomisid* appearance.

♀. Cephalothorax, 1.6 mm. long, 2 mm. broad; abdomen, 2.3 mm. long, 5.2 mm. broad.

*Cephalothorax* broadly ovate, broader than long. *Pars cephalica* pilose, arched, sides declivous, truncated in front, hoary with yellowish markings; *ocular area* broader than long; *clypeus* narrow, not deep. *Pars thoracica* broad, arched, pilose, yellow, with median and lateral white spots; radial grooves faintly discernable; *marginal band* narrow, white (fig. 11). *Eyes* normal. *Legs* moderately long, robust, pilose, white with yellow annulations, armed with numerous moderately long and moderately strong spines; underside of legs pale yellow. Relative lengths, 4, 1, 2, 3. *Palpi* short, robust, similar in colour, clothing, and armature to legs. *Falces* short, pilose, white, arched. *Maxillae* and *labium* normal, white. *Sternum* broadly oval, white, arched. *Abdomen* broadly ovate, boldly overhanging base of cephalothorax, wavy in outline, anterior angle truncated, upper-surface convex, pilose, yellowish-grey, ornamented with white markings and black spots, margin lighter in colour than the median area; inferior surface concave, light grey, corrugated, corrugations marked with dark-brown spots. On the younger forms the abdominal markings show some variation, but naturally such are not constant.

*Hab.*—Moorilyanna Native Well. The three examples of *D. thomisoides* were included among some specimens of *Thomisidae*, and the dates on the collector's label in the tube reads "July 28, 29, 30, 1914."

#### Family THOMISIDAE.

Several specimens, and these representing three genera, were collected by Captain White—namely, *Tmaris*, *Diaea*, and *Stephanopsis*—and it is curious to note that the majority of these are immature.

Of the genus *Tmaris* there are two species, one of which (consisting of only one specimen) is not only immature, but too damaged for specific determination; nevertheless, I am confident it is distinct from the one for which I propose the name *T. punctatus*. As no species of its genus has, up to the present moment, been described or recorded from Central Australia, it is quite probable it is also an undescribed form, but before naming it I await further and more perfect

examples. *T. punctatus* is a male, and not quite fully developed. Likewise, of the genus *Diaea* there are again only two species, one of which is probably *D. punctata*, L. Koch, and the other, which is certainly new, I propose to name *D. pulleinei*, in honour of my esteemed friend, Dr. Pulleine, of Adelaide. The two half-grown examples of *Stephanopsis* appear to be undoubtedly referable to O. P. Cambridge's *S. altifrons*.

TMARUS PUNCTATUS, n. sp.

Pl. lxxviii., figs. 12 and 13.

♂. Cephalothorax, 1.4 mm. long, 1 mm. broad; abdomen, 2.5 mm. long, 1.4 mm. broad.

*Cephalothorax* obovate, grey. *Pars cephalica* strongly arched, not higher than thoracic segment, front and sides declivous, grey with a few black spots, and having a few long bristly hairs. *Ocular area* broader than long; *clypeus* deep, fringed with hairs. *Pars thoracica* strongly arched, sides rounded and declivous, posterior angle declivous and indented; upper-surface grey, with yellowish and white markings, and furnished with a few long bristly hairs; sides grey, with yellowish markings; posterior angle yellowish; *marginal band* broad, grey. *Eyes* distributed normally; each eye seated upon a slightly elevated tubercular eminence; front lateral eyes largest, and rear lateral eyes much the smallest. *Legs* moderately long and moderately strong, tapering, pilose, spined, upper-surfaces yellowish-grey, lower-surface light-grey, annulated; first and second pairs equal in length, third pair short, fourth pair missing. *Palpi* similar in colour, clothing, and armature to legs; short. *Falces* moderately long, arched, tapering, grey, pilose. *Maxillae* and *labium* grey; normal. *Sternum* grey, arched, pilose, cordate, with lateral extensions, the points of which terminate between the coxae; posterior extremity acuminate and terminating between fourth pair of coxae. *Abdomen* elongate, obovate, arched, overhanging base of cephalothorax; superior surface grey, with large and small black spots and lateral black markings near posterior extremity; at anterior extremity there are two submedian protuberances, while the posterior extremity is strongly humped (figs. 12 and 13); sides grey, striate-punctate; inferior surface light grey, relieved by a median and elongate patch of yellow-grey with black lateral spots; this patch extends from the *rima epigasteris* to near spinners; in front of *rima epigasteris* there is a large dark-brown patch, broader than long and uneven in outline.

*Hab.*—Moorilyanna Native Well, "July 28, 29, and 30, 1914." Immature.

## DIAEA (?) PUNCTATA, L. Koch (immature).

Die Arach. des Aust., ii., 1876, p. 819, pl. lxx., figs. 6 and 6a.

*Hab.*—Between Todmorden and Wantapella Swamp, July, 1914.

## DIAEA PULLEINEI, n. sp.

Pl. lxxviii., figs. 14 and 15.

♂. Cephalothorax, 1 mm. long, 1 mm. broad; abdomen, 1.3 mm. long, 1 mm. broad.

*Cephalothorax* arched, broad, furnished with long bristles. *Pars cephalica* yellow, truncated in front, not higher than thoracic segment; *ocular area* much broader than long; *clypeus* deep. *Pars thoracica* yellow, with broad reddish-brown lateral bars extending from ocular region to posterior angle; sides rounded; *marginal band* narrow. *Eyes* normally distributed, black; each poised at the summit of a hoary tubercle. *Legs* rather long, strong, yellow, with reddish-brown annulations, hairy, spined. Relative lengths, 1, 2, 4, 3. *Palpi* short, yellow, similar in clothing and armature to legs, genital bulb rather large, no apophysis present (fig. 14). *Falces* short, yellow, hairy, not strong, arched, coniform. *Maxillae* and *labium* normal, hairy, yellow. *Sternum* concolorous with foregoing, shield-shaped, surface rather flat, sides arched, moderately hairy. *Abdomen* ovate, hairy, arched, overhanging base of cephalothorax, yellow; upper-surface ornamented with white and brown spots; at the middle there is a broad, broken, transverse brown bar; just below the latter, and extending towards the spinnerets, there are two brown bars, which are wavy in outline, retreating and converging inwards, but the apices do not meet (fig. 15); ventral surface yellow, with reddish-brown median and lateral bars; the latter are linked together by a procurved transverse bar immediately in front of the spinnerets.

*Hab.*—Moorilyanna Native Well, "July 28, 29, and 30, 1914."

## STEPHANOPSIS ALTIFRONS, O. P. Cambr.

Ann. Mag. Nat. Hist., iii., 4, 1869, p. 61, pl. v., figs. 33 to 39; L. Koch: Die Arach. des Austr., i., 1874, p. 495, pl. xxxviii., fig 1.

*Hab.*—Moorilyanna Native Well, "July 28, 29, and 30, 1914." Immature.

## Family CLUBIONIDAE.

## ISOPEDA CONSPERSULA (?) (♂), Strand.

Zool. Jahrb., 1913, p. 610.

*Hab.*—Everard Range, "up to August 14, 1914." Only one specimen, and that an immature form of what I take to be the above species.

## ISOPEDA LEISHMANNI, Hogg.

Proc. Zool. Soc., Lond., 1902, p. 437, fig. 90.

*Hab.*—Flat Rock Hole and Wantapella Swamp, Everard Range. Several specimens of this species were obtained, from which it is apparent that *I. leishmanni* is a somewhat variable form, both in size and general appearance.

## CLUBIONA ROBUSTA, L. Koch.

Die Arach. des Aust., i., 1873, p. 417, pl. xxxiii., figs. 2, 2a, 2b, 3, 3a, 3b.

*Hab.*—Moorilyanna Native Well, end of July, 1913, male; Flat Rock Hole, Everard Range, July 30, 1914.. male and female.

## CHIRACANTHIUM(?) PENNULIFERUM (♂), Simon.

Die Fauna Sud-west Aust., ii., 1909, p. 162.

*Hab.*—Flat Rock Hole, Everard Range, July 30, 1914.. A single specimen, an immature male, and in all probability referable to Simon's species.

## MITURGA LINEATA, Thor.

Oef. Kongl. Vet. Akad. Förh., 4, 1870, p. 376; L. Koch: Die Arach. des Aust., i., 1872, p. 351, pl. xxvii., figs. 6, 6a, 7, 7a-7e.

*Hab.*—Everard Range to Wantapella Swamp. Two specimens.

## Family PISAURIDAE.

## DOLOMEDES FACETUS, L. Koch.

Die Arach. des Aust., ii., 1876, p. 839, pl. lxxiv., figs. 5, 5a, 5b.

*Hab.*—Everard Range, "Up to August 14, 1914." Two specimens of this widely distributed species were obtained. *D. facetus* occurs in New Zealand and on the Island of Upolu.

## Family LYCOSIDAE.

## LYCOSA LEONHARDII, Strand.

Zool. Jahrb., 1913, p. 618.

*Hab.*—Everard Range to Wantapella Swamp. One female specimen; immature.

## LYCOSA(?) TOPAZIOPSIS, Hogg.

Rep. Horn Expl. Exped., ii., Zool., 1906, p. 347, pl. xxiv., fig. 14.

*Hab.*—Between Musgrave Ranges and Everard Range.. One specimen, immature and in bad condition.



## LYCOSA (?) IMMANSUETA, Simon.

Die Fauna Sud-west Aust., ii., 1909, p. 183, fig. 1.

*Hab.*—Todmorden, ninety miles west of Oodnadatta, July, 1914. Two female specimens, one adult and damaged and one about half-grown. Although I have inserted a (?) in connection with these specimens, I think, notwithstanding that the adult is damaged, there can be little doubt as to the correctness of the determination; indeed, the *epigynum* would seem to bear out this view, although it is unfortunately somewhat distorted.

## LYCOSA NIGROPUNCTATA, n. sp.

Pl. lxxviii., figs. 16 and 17.

♀. Cephalothorax, 6 mm. long, 5 mm. broad; abdomen, 7.2 mm. long, 5 mm. broad.

*Cephalothorax* obovate, pilose. *Pars cephalica* arched, raised, orange-yellow, with dark-brown spots, truncated in front, thoracic segment well defined, sides declivous; *ocular area* longer than broad, clothed with long black hairs, which impart a dark appearance; eyes fringed with grey; *clypeus* deep, pilose, and furnished with three or four black bristles below front row of eyes. *Pars thoracica* broad, arched, median and lateral grooves well defined, dark; *marginal band* broad, yellow, spotted with black, fringed with fine hairs. *Eyes* in three rows of 4, 2, 2; anterior row very slightly procurved, small, lateral eyes smallest; the pair constituting the second row are not only large, but are also slightly larger than their near neighbours; eyes of second row separated from each other by a space equal to fully once their individual diameter, and those of the third row by a space equal to fully twice their individual diameter. *Legs* long, strong, yellow, hairy, spined, tarsi scopulated, superior claws long. Relative lengths, 4, 1, 2, 3. *Palpi* long, similar in colour, clothing, and armature to legs. *Falces* long, strong, tapering, well arched, hairy, yellow, inner margins fringed with coarse black hairs; *fangs* long, dark-brown. *Maxillae* yellow, long, arched, clothed with long coarse hairs or bristles, rounded at heel, apices broad, inclining inwards, inner angles obliquely truncated. *Labium* yellow, but darker than maxillae, darkest at base, short, broad, well arched, apex truncated, slightly indented at centre, fringed with dark hairs. *Sternum* broad, truncated in front, well arched, dark brown, margin yellow, densely clothed with dark hairs. *Abdomen* ovate, hairy, overhanging base of cephalothorax, upper-surface yellow and having several slightly darker yellow, broad, transverse, curved bars; these latter are well curved, and do not suggest eschelons; distributed over the surface there are a number of large and small black spots;

sides yellow, mottled with numerous pale-yellowish spots; inferior surface concolorous with sides, but having in addition a broad, longitudinal, median smoky bar, which latter terminates some little distance from the spinnerets (fig. 16). *Epigynum* simple, composed of two widely separated, obliquely directed oval pits (fig. 17). *Spinnerets* short, yellow, and clothed with yellow and dark hair.

*Hab.*—Flat Rock Hole, Musgrave Ranges, July 24, 1914. Two specimens, one mature and the other half-grown. In reference to the larger specimen the collector's note reads, "Out of hole with trap-door." The trap-door, a specimen of which was enclosed, is of the wafer type, and is made up of layers of silk, in the meshes of which fine gravel has been incorporated; it has a circumference of 42 mm. A third specimen, also from Flat Rock Hole, but without date, is considerably smaller than the one described and figured as the type; further, the black abdominal spots are very small and very few in number, and the transverse bars are absent, but the *epigynum* is fully developed and is exactly like the form described and figured herewith. Apparently the species is variable.

#### Family OXYOPIDAE.

Amongst the material collected by Captain White there are a number of small spiders which, on account of the large size of the second pair of eyes, suggest affinity to Simon's genus *Hostus*; in fact, when I first examined them I thought I should have to record the occurrence of that Madagascan genus in Australia. A closer examination, however, when engaged upon the task of preparing the present paper, brought to light characters excluding this species from that and every other genus included in the family *Oxyopidae*. The family is well distributed over the globe, but it is a small one, consisting of (including the new genus described below) only eleven genera. The majority of the species—and they are not many—are remarkable for their beauty and gracefulness, the compactness of the grouping of the eyes, length of maxillae and labium, and also for their long legs. In the species now under review the eyes, as already pointed out, bear a superficial resemblance to those of the Madagascan genus, but contrary to that or any other *Oxyopid*, the labium, instead of being truncated, is coniform, and therefore has the apex obtusely pointed, while the legs are only moderately long. It is for the reason of its somewhat superficial resemblance to Simon's genus, quoted above, that I propose for the reception of this interesting *Araneid* the generic name *Pseudohostus*, the description of which I append herewith.

## PSEUDHOSTUS, n. g.

Pl. lxviii., figs. 18 and 19.

*Cephalothorax* oval, massive, segmental groove separating *pars cephalica* from *pars thoracica* faintly defined. *Pars cephalica* strongly arched, obtusely truncated; *ocular area* broader than long; *clypeus* deep. *Pars thoracica* strongly arched, broad; median and radial grooves faintly defined; sides and posterior area steep. *Eyes*, eight, distributed over three rows of 2, 2, 4; anterior eyes minute, second pair largest, and also somewhat larger than those forming the rear row; posterior eyes of equal size, and forming a strongly procurved row (fig. 18). *Legs* not strong, only moderately long, armed with long, fine spines, not scopulated; claws, three; superior claws long, well curved, weak, furnished with numerous long, fine teeth. Relative lengths, 1, 2=4, 3. *Palpi* short. *Falces* rather long, coniform; *fana* short, weak. *Maxillae* long, apices converging inwards, truncated, acuminate, heel rounded (fig. 19). *Labium* long, coniform (fig. 19). *Sternum* elongate, truncated in front, acuminate at rear, and terminating between fourth pair of coxae. *Abdomen* ovate. *Spinnerets* compactly grouped, uniarticulate, cylindro-coniform.

## PSEUDHOSTUS SQUAMOSUS, n. sp.

Pl. lxviii., figs. 20 and 21.

♀. *Cephalothorax*, 1·7 mm. long, 1·4 mm. broad; *abdomen*, 2·5 mm. long, 1·7 mm. broad.

*Cephalothorax* oval, smooth, shining, furnished with a few short hairs, and, when not rubbed, a profusion of white, elliptical scales; yellow, with dark markings, the latter variable. *Pars cephalica* strongly arched, sides declivous, obtuse in front, junction with thoracic segment faintly defined; *ocular area* broader than long, hairy; *clypeus* narrow, but very deep. *Pars thoracica* broad, strongly arched, sides and posterior area very steep, radial and lateral grooves faintly defined; *marginal band* broad, pale yellow. *Eyes* black; in three rows of 2, 2, 4; anterior pair widely removed, minute; second pair largest of the series, and separated from each other by a space equal to fully twice their individual diameter; the four constituting the third row form a strongly procurved line, and widely removed from each other; each lateral eye of this row is separated from its inner neighbour by three times its individual diameter, and the two median eyes from each other by a space equal to about two and a half diameters (fig. 18). *Legs* moderately long, yellow, tapering, hairy, armed with long, fine spines, tarsal joints not scopulated. Relative lengths, 1, 2=4, 3. Superior claws long, well curved, and

furnished with a large number of long, fine, parallel teeth. *Palpi* not long, similar in colour, clothing, and armature to legs. *Falces* yellow, moderately long, coniform, hairy; *fang* short and weak. *Marillae* long, yellow, arched, moderately hairy, apices truncated, inner angles acuminate, inclining inwards and fringed with dark hairs; heel rounded (fig. 19). *Labium* concolorous, long, coniform moderately hairy (fig. 19). *Sternum* concolorous also, elongate, truncated in front, arched, moderately hairy, apex obtusely acuminate and terminating between fourth pair of coxae. *Abdomen* ovate, slightly overhanging base of cephalothorax, strongly arched, pubescent, and, when not rubbed, clothed with numerous white elliptical scales; the general colour of the superior surface is yellow, with dark markings, but the latter vary in size, form, and distribution in different individuals; inferior surface yellow, with more or less intense dark markings, the surface pilose, and carrying scales similar to those already described (fig. 20). *Epigynum*: This organ consists of two circular depressions (fig. 21), but the latter are so densely clothed with hairs and scales that they are exceedingly difficult to locate. *Spinnerets* yellow, hairy, compactly grouped, uniarticulate, cylindroconical; in front of inferior mammillae there is a small, obtuse *colulus*.

*Hab.*—Moorilyanna Native Well, July 28, 29, 30; Flat Rock Hole, Musgrave Ranges, July 30, 1914. The series collected embraces individuals of different ages and different stages of growth, and these display considerable colour variation.

#### Family SALTICIDAE.

Of this family five species were collected, and the majority of these were immature or more or less damaged. Two of the five species are apparently new, and so are herewith described. None call for special comment.

#### COSMOPHYSIS (?) BITAENIATUS, Keys.

*Sobara bitaeniata*, Keys, in L. Koch: Die Arach. des Aust., ii., 1882, p. 1365, pl. cxv., figs. 8, 8a to 8d, 9.

*Hab.*—Flat Rock Hole, Musgrave Ranges, July, 1914. An immature male of what may in all probability prove to be the above species.

#### PYSTIRA ORBICULATA, L. Koch.

*Hasarius orbiculatus*, L. Koch: Die Arach. des Aust., ii., 1881, p. 1285, pl. cx., figs. 1, 1a, 1b, 2, 2a to 2c.

*Hab.*—Flat Rock Hole, Musgrave Ranges, July, 1914. Two specimens, both immature.

## HASARIUS, sp.

*Hab.*—Two specimens from Flat Rock Hole, July, 1914, and one from Moorilyanna Native Well, July 28-30, 1914. Each of these belong, apparently, to the same species, but are too immature for description.

## SERVAEA OBSCURA, n. sp.

Pl. lxxviii., fig. 22.

♀. Cephalothorax, 2.2 mm. long, 1.8 mm. broad; abdomen, 3.6 mm. long, 2.2 mm. broad.

*Cephalothorax* ovate, nearly parallel-sided, chocolate-brown, shining. *Pars cephalica* rather flat, not impressed, inclined forward, sides declivous; *ocular area* broader than long, each eye fringed with tawny and hoary hairs; *clypeus* not deep, fringed with rather long hairs. *Pars thoracica* furnished with a few white and tawny adpressed scales, and marked by a large but not well-defined depression, sides declivous, sloping sharply rearwards, and retreating laterally to posterior angle; *marginal band* broad, yellow. *Eyes* in three rows of 4, 2, 2. Front row recurved; median anterior pair much the largest of the entire series, intermediate pair (second row) minute, posterior eyes somewhat smaller than front lateral eyes. *Legs* short, robust, hairy, armed with long, very fine spines; coxae and base of each femur pale yellow; from thence upper-surface and sides of each leg yellow, with dark-brown annulations; inferior surface of each yellow. Relative lengths, 1, 4, 2, 3. *Palpi* short, robust, similar in colour and armature to legs. *Falces* not long, robust, arched, concolorous with cephalothorax, hairy, almost geniculate. *Maxillae* and *labium* yellowish, normal. *Sternum* elongate, brown, arched, clothed with long hoary hairs. *Abdomen* ovate, slightly overhanging base of cephalothorax, arched, superior surface and sides chocolate-brown, slightly pubescent, and having a number of white and tawny scales; these latter, like those on cephalothorax, lie flat upon the surface, are elliptical, and each one has a distinctly raised ridge or "mid-rib" running down the centre, and is finely and laterally striated; inferior surface yellow-brown and furnished with hoary scales. [All three specimens have apparently been rubbed, and so have lost a large number of their scales.] *Epigynum* small, difficult to locate owing to preponderance of scales; it consists of two circular depressed discs, the edges of each of which are raised so as to form a ridge (fig. 22).

*Hab.*—Flat Rock Hole, Musgrave Ranges, July, 1914.

## TRITE ORNATA, n. sp.

Pl. lxxviii., figs. 23 and 24.

♀. Cephalothorax, 2.2 mm. long, 1.5 mm. broad; abdomen, 2.3 mm. long, 1.5 mm. broad (fig. 23).

*Cephalothorax* ovate, elongate. *Pars cephalica* golden-yellow, flat, slightly inclined, sides steep, pubescent, with fine hoary hairs, interspersed by stiff black hair; *ocular area* longer than broad, eyes ringed with black; *clypeus* not deep. *Pars thoracica* arched, bright yellow, pubescent, clothed with hoary hairs interspersed with stiff black hairs, retreating laterally and sloping posteriorly; *marginal band* yellow. *Eyes* in three rows of 4, 2, 2; front row recurved, median pair of this row larger than their lateral neighbours; those of the second row minute, and seated near to their anterior lateral neighbours; rear pair of eyes slightly larger than the anterior laterals. *Legs* yellow; first pair exceedingly robust; hairy, and armed with spines, those on the first pair being much the strongest. Relative lengths, 1, 4, 2, 3. In the type, which is mature, only one leg, and that of the first pair, is present, all the others having been broken off and lost; but in an immature form the ambulatory limbs are intact. *Palpi* short, similar in colour and armature to legs. *Falces* yellow, arched, coniform, hairy. *Maxillae* and *labium* yellow, normal. *Sternum* elongate, arched, obtusely acuminate and attenuated in front, moderately hairy. *Abdomen* ovate, arched, slightly overhanging base of cephalothorax, hairy; superior surface and sides yellow, with dark median and lateral markings; inferior surface has a broad, median yellow band, transversely striated, and relieved by pale-yellow spots between striations; this band extends from the *rima epigasteris* to the spinnerets; laterally the abdomen (ventral surface) is white and reticulated by dark yellow markings. *Epigynum* transverse, broader than long, situated on a dark-yellow field; it is bisected, and each half presents an appearance suggestive of a square, at the outer extremity of the lower arm of each of which there is a large oval depression (fig. 24).

♂. An immature example of this sex is also included in the collection, and bears the same locality and date as that of the two females. It agrees in colour and clothing to the form described above, and is also very similar in abdominal ornamentation. As the palpal organs are not uncovered further description is unnecessary.

*Hab.*—Flat Rock Hole, Musgrave Ranges, July 23, 1914. One mature female (damaged) and one immature female (intact), together with an immature male example, all from same locality and collected on the same date.

## DESCRIPTION OF PLATES.

## PLATE LXVII.

- Fig. 1. *Aganippe whitei*; eyes.  
 „ 2. „ „ scheme of dentition.  
 „ 3. *Cryptoerithus occultus*; cephalothorax.  
 „ 4. „ „ abdomen in profile.  
 „ 5. „ „ epigynum.  
 „ 6. *Echemus*(?) *griseus*; male, palpus from above.  
 „ 7. *Argyrodes binotata*; male, palpus from above.  
 „ 8. „ „ abdomen.  
 „ 9. *Dolophones intricata*.  
 „ 10. „ „ epigynum.

## PLATE LXVIII.

- Fig. 11. *Dolophones thomisoides*.  
 „ 12. *Tmarus punctatus*.  
 „ 13. „ „ abdomen in profile.  
 „ 14. *Diaea pulleinii*; male, palpus from beneath.  
 „ 15. „ „  
 „ 16. *Lycosa nigropunctata*.  
 „ 17. „ „ epigynum.  
 „ 18. *Pseudohostus squamosus*; eyes.  
 „ 19. „ „ maxillae and labium.  
 „ 20. „ „ in profile.  
 „ 21. „ „ epigynum.  
 „ 22. *Servaea obscura*; epigynum.  
 „ 23. *Trite ornata*; in profile.  
 „ 24. „ „ epigynum.

## (i) INSECTA.

By ARTHUR M. LEA, F.E.S., Museum Entomologist.

[*Contribution from the South Australian Museum.*]

The collection of invertebrates brought back by Captain White consisted altogether of 1,653 specimens; of the true insects, the ants have been worked out by Professor Wheeler (of Harvard University), the moths by Dr. Turner (of Brisbane), and the beetles by myself; the bugs have been sent to Mr. Distant (of the British Museum), but the manuscript relating to same has not yet been received. Of the other insects, the *Orthoptera* are represented by 27 species, the *Neuroptera* by 6 species, the *Diptera* by 4 species, and the *Hymenoptera* (other than ants) by 3 species.

Probably, so far as the insects are concerned, a worse time could not have been selected for collecting; nevertheless, some very interesting species were obtained, and the large proportion of new forms amongst the ants indicates how little is known of these interesting insects from the dryer parts of Australia. Of the beetles, the most interesting species are a

representative of a new genus of weevils and a large ground-beetle, *Hyperion schroetteri*; the latter hitherto has been supposed to be confined to the heavily-timbered districts of Eastern Australia, most of the specimens known having been obtained from the pipes of iron-bark trees and other large species of *Eucalyptus*, so that its occurrence in the vicinity of Oodnadatta is noteworthy. One very satisfactory feature of the collection is the perfect condition of most of the specimens, other than those of which only fragments were seen.

### Coleoptera.

GARABIDAE. — *Calosoma schageri*, Er. Wantapella, Everard Range. *C. walkeri*, Waterh. Everard Range. *Chlaenioidius herbaceus*, Chaud. Todmorden. *Chlaenius australis*, Dej. Todmorden. *Euryscaphus waterhousei*, Macl. (fragments). Everard Range. *Hyperion schroetteri*, Schreib. Oodnadatta. *Philophlaeus planus*, Chaud. Oodnadatta. *Philoscaphus tuberculatus*, Macl. (fragments). Everard Range. *Phloeocarabus crudelis*, Newm. Todmorden to Wantapella. *Platynus marginicollis*, Macl. Everard Range. *Scaraphites rotundipennis*, Dej. Oodnadatta.

DYTISCIDAE. — *Antiporus gilberti*, Clark. Moorilyanna. *Eretes australis*, Er. Flat Rock Hole. *Necterosoma penicillatum*, Clark. Everard Range.

HYDROPHILIDAE. — *Philhydrus andersoni*, Blackb. Flat Rock Hole, Todmorden.

HISTERIDAE. — *Saprinus cyanellus*, Mars. Everard Range.

NITIDULIDAE. — *Haptoncura lindensis*, Blackb. Wantapella. *Thalycrodes australe*, Germ. Todmorden.

COLYDIIDAE. — *Ditoma hilaris*, Blackb. Everard Range.

SCARABAEIDAE. — *Anoplognathus macleayi*, Blackb. (fragments). Everard Range. *Haplonycha testaceipennis*, Macl. Oodnadatta. *Heteronyx alienus*, Blackb. Flat Rock Hole. *Semanopterus rectangulus*, Blackb. Oodnadatta to Todmorden. *Trox litigiousus*, Har. Musgrave and Everard Ranges. *T. quadridens*, Blackb. Musgrave and Everard Ranges, Moorilyanna.

BUPRESTIDAE. — *Chalcophora angulipennis*, Blackb. (fragments). Everard Range.

ELATERIDAE. — *Monocrepidius nitidulus*, Cand. Todmorden.

BOSTRYCHIDAE. — *Bostrychopsis jesuita*, Fab. Flat Rock Hole.

TENEBRIONIDAE. — *Caedius sphaeroides*, Hope. Moorilyanna. *Chalcopterus tinctus*, Blackb. Moorilyanna to Everard Range. *Hypaulax orcus*, Pasc. Indulkana, Wantapella, Musgrave Ranges. *Pterohelaeus fraternus*, Blackb. Todmorden,



Everard Range. *Saragus pascoei*, Macl. Everard Range. *S. strigiventris*, n. sp. *Seirotana parallela*, Germ. Oodnadatta. *Tribolium ferrugineum*, Fab. Wantapella.

PEDILIDAE.—*Egestria sulcicollis*, Blackb. Moorilyanna.

CURCULIONIDAE. — *Acantholophus simulator*, Ferg. Oodnadatta. *Acherres granulatus*, Ferg. Flat Rock Hole. *Auletes tibialis*, n. sp. *Cisowhitea longicollis*, n. sp. *Epamaebus ziczac*, Lea. Moorilyanna. *Glaucopela fasciata*, n. sp. *Leptops contrarius*, Blackb. Musgrave to Everard Ranges. *Molochtus tibialis*, Sloane. Everard and Musgrave Ranges, Moorilyanna, Wantapella. *Myrmacielus pilosicornis*, n. sp. *Polyphrades satelles*, Blackb. Musgrave to Everard Ranges. *Sclerorhinus elderi*, Sloane. Musgrave and Everard Ranges, Flat Rock Hole. *Xeda fasciata*, n. sp.

CERAMBYCIDAE.—*Phoracantha posticalis*, Blackb. Oodnadatta. *P. recurva*, Newm. Everard Range, Oodnadatta, *Sympetes collaris*, Don. Flat Rock Hole.

CHRYSOMELIDAE.—*Diandichus analis*, Chp. Everard Range. *Ditropidus whitei*, n. sp. *Paropsis beata*, Newm. Oodnadatta. *P. latyralis*, Blackb. Wantapella, Everard Range.

COCCINELLIDAE.—*Scymnus meyricki*, Black. Moorilyanna.

#### SARAGUS STRIGIVENTRIS, n. sp.

Black; margins of head, prothorax, and elytra obscurely diluted with red; antennae, palpi, and tarsi castaneous.

*Head* with dense but rather small punctures between eyes, much smaller elsewhere. Antennae passing base of prothorax, third joint almost as long as fourth and fifth combined. *Prothorax* at base about four times as wide as median length, rather strongly convex, front angles rounded and produced to widest part of head; margins rather wide in front and gently upturned, increasing in width to base, and there turned down; with minute scattered punctures, slightly more conspicuous on sides than elsewhere. *Scutellum* almost twice as wide as long. *Elytra* as wide as long, rather strongly convex, outlines continuous with those of prothorax; with numerous rows (about twenty on each elytron) of distinct but rather small punctures, the interspaces with very minute ones; margins wide at the base and narrow posteriorly, feebly wrinkled and with very small punctures; epipleurae widely concave at base, and gently so at apex. *Metasternum* granulate at sides. *Abdomen* rather densely punctate and longitudinally strigose. Length,  $10\frac{1}{2}$ -12 mm.

*Hab.*—Everard Range. Type, I. 5181.

The specimen taken by Captain White is subopaque and without legs or antennae, but it was obtained in that condition.

A specimen from Eyre Sand Patch (from Blackburn's collection, taken by W. Graham) is, however, in perfect condition, and is rather highly polished. In general appearance the species is like *pascoei* on a greatly reduced scale.

EGESTRIA SULCICOLLIS, Blackb.

There are two co-types of this species in the Museum, both labelled as from Ayers Rock (the type locality). The original description is misleading, as the prothorax was described as "*longitudinaliter subtiliter valde perspicue canaliculato*"; as a matter of fact the prothorax of the male co-type (the other is reversed) has been scratched down the middle, giving it, to a certain extent, a grooved appearance. The hind tibiae of the male are remarkable, and were not even mentioned; commencing at the base of each there is a conspicuous flange-like process (lightly concave on its upper-surface), that abruptly terminates at the basal third; where it ends inwardly there is a smaller semi-erect process, that can be easily overlooked from certain directions; but the two from many directions are extremely conspicuous; the female hind tibiae are not remarkable. Two males and one female were taken by Captain White at Moorilyanna.

XEDA FASCIATA, n. sp.

Black; antennae (club slightly infuscated) and legs (femora almost black) reddish. Moderately densely clothed with scales.

*Head* with rather dense, partially concealed punctures. Eyes subtriangular, rather closely approaching each other. Rostrum slightly shorter than prothorax; with rather coarse punctures in irregular grooves behind antennae, punctures much smaller in front of same. Scape inserted about one-third from apex of rostrum, about half as long as funicle and club combined; first joint of funicle as long as two following combined. *Prothorax* lightly transverse, sides almost evenly diminishing in width from base to apex, the former almost twice the width of the latter; with dense, partially concealed punctures. *Elytra* almost parallel-sided to near apex; with rows of subquadrate punctures in rather shallow striae, the punctures becoming smaller, but the striae deeper, on apical slope; interstices with rather dense more or less concealed punctures. *Under-surface* with dense normally concealed punctures. *Legs* moderately long; femora rather stout, edentate. Length,  $3\frac{1}{2}$  mm.

*Hab.*—Moorilyanna. Type (unique), I. 5186.

About the size of *notabilis*, and the derm similarly coloured, but the elytral setae much shorter and less conspicuous; on that species they are conspicuous from any direction,

but on the present species they are visible only from the sides and scarcely elevated about the general clothing. On the type the clothing on the upper-surface is subdepressed, and consists of rather thin scales or stout setae, white and conspicuous in places, black or sooty-brown in others, the derm beneath the latter at first glance appearing to be glabrous; on the head the scales are mostly dark; on the prothorax a large portion of the disc and a fairly large spot on each side are clothed with dark scales, elsewhere the scales are white or whitish; on the elytra most of the clothing is dark, but there is a rather conspicuous white fascia across the summit of the apical slope, an interrupted one at the apex, and remnants of others across the middle and at the base; on the under-surface the scales are snowy, and closely applied to the derm, but on the second abdominal segment there is a conspicuous median yellowish spot; on the legs the scales and setae are white. The type is probably a male, and the conspicuous abdominal spot is probably confined to that sex.

GLAUCOPELA INTERIORIS, n. sp.

Reddish-castaneous; metasternum deeply infuscated. Rather densely clothed with depressed scales varying from white to dark-brown.

*Head* with dense, concealed punctures. Eyes separated less than width of rostrum at base. Rostrum about the length of prothorax, moderately curved; with minute punctures except at base, where they are coarse but concealed. Antennae inserted at about basal two-fifths of rostrum, scape scarcely half the length of funicle; basal joint of funicle about as long as the three following combined. *Prothorax* moderately transverse, base truncate, sides gently rounded from base to in front of middle, and then strongly decreasing in width to apex; punctures dense but almost entirely concealed. *Elytra* not much wider than prothorax, almost parallel-sided to near apex; with regular, narrow striae, containing deep punctures; interstices with dense, concealed punctures. *Under-surface* with dense, concealed punctures. *Legs* moderately long; front coxae lightly separated; femora rather stout, edentate. Length,  $2\frac{2}{3}$  mm.

*Hab.*—Flat Rock Hole. Type (unique), I. 5185.

According to Blackburn's table this species (if not referred to a new genus) should be placed in *Glaucopela*, but its rostrum is longer in proportion than in any species previously referred to that genus; the front sides of the prothorax are obliquely cut off as on all the species of *Glaucopela*, and very different to those of *Cydmaea* and *Dicomada*, to which genera, at first glance, it appears to approach. The polished rostrum, clothed

only about the extreme base, appears to indicate that the type is a female. The tip of the club is slightly infuscated. Nearly all species of the genus have variable clothing; on the type, evidently in perfect condition, the scales on the head are almost entirely white and fairly dense; the rostrum is glabrous except at the extreme base; on the prothorax each side is densely clothed with white scales, elsewhere dark chocolate-brown scales are dense, but mixed with a few pale ones; on the elytra the white scales are denser on the apical slope than elsewhere, on a dilated space on the suture before same they are dark, on other parts of the elytra the scales have a somewhat mottled or feebly lineate appearance; on the under-surface and legs the scales are silvery, but with a rosy flush in places, and slightly greenish on and about the coxae.

MYRMACICELUS PILOSICORNIS, n. sp.

Deep black.

*Head* with minute punctures. Eyes large and close together. Rostrum lightly curved, about as long as front femora; with dense and rather fine punctures, larger on sides at base than elsewhere. Antennae with apical two-thirds clothed with conspicuous and rather long hairs; scape short; first joint of funicle distinct but transverse, the others very short and closely applied; club longer than funicle and scape combined. *Prothorax* much longer than wide, sides rounded on apical two-thirds; disc with small but sharply defined punctures, becoming larger on sides; base depressed, narrow, subopaque, and with crowded punctures. *Elytra* subopaque and finely shagreened; with very feeble remnants of striation. *Legs* rather long and stout; claw joint projecting well beyond lobes of third. Length,  $3\frac{1}{2}$ -4 mm.

*Hab.*—Flat Rock Hole. Type, I. 5183.

The subopaque elytra and base of prothorax, with the very different clothing of antennae, readily distinguishes from all previously described species of the genus.

AULETES TIBIALIS, n. sp.

Deep black, but in places with a vague brassy gloss; knees and tibiae more or less reddish. Upper-surface with moderately long and almost uniform ashen pubescence, becoming shorter on under-surface.

*Head* evenly convex; with moderately dense and small, but sharply defined punctures. Eyes very prominent. Rostrum rather long, slightly dilated to apex; with fairly coarse punctures and an impressed line at base, elsewhere with much smaller punctures. Antennae long and thin, inserted almost at extreme base of rostrum. *Prothorax* almost as long as

wide, sides gently increasing in width from apex to near base, and then suddenly narrowed; with dense and fairly coarse punctures. *Elytra* not very wide, each with a narrow sutural stria; with dense punctures, small and rugose posteriorly; some large ones on basal third. Length,  $2\frac{1}{2}$  mm.

*Hab.*—Flat Rock Hole. Type (unique), I. 5184.

A deep-black species, larger and more regularly clothed than *uniformis*, with narrower elytra and shorter and almost straight rostrum; *imitator* is a smaller species, with darker tibiae, shorter rostrum, and sparser clothing. On the basal third of each elytron there are some fairly large punctures, forming short irregular rows (about four) on the sutural half; immediately behind the shoulders there are some similar punctures, but with the linear arrangement less conspicuous.

#### CISOWHITEA, n. g.

*Head* small, concealed from above. Eyes lateral, coarsely faceted. Rostrum long, rather thin, almost straight; scrobes invisible from above. Antennae inserted almost in exact middle of sides of rostrum; scape about half as long as funicle and club combined, first joint of funicle as long as two following combined, the others short; club rather short. *Prothorax* subconical, front rather strongly produced, ocular lobes feeble. *Scutellum* apparently absent. *Elytra* distinctly wider than prothorax, elongate subcordate, each separately rounded at base. *Pectoral canal* deep and moderately wide, leaving four front coxae exposed internally, and ending as a slight notch in metasternum. Metasternum moderately long; episterna narrow. Two basal segments of *abdomen* elongate. *Legs* not very long; femora stout, edentate, not grooved; tibiae bisinuate on lower-surface, apex with a short stout spur; tarsi rather short, third joint moderately bilobed but not wider than the preceding ones, claw joint moderately long. Densely squamose.

A very curious genus of the *Cryptorhynchides*; the type in general appearance from above appears to belong to the vicinity of *Achopera*, but the pectoral canal is very different to that of any of the allies of *Chaetectetorus*, except *Deretiosus*, whose legs and prothorax are very different; for the present, however, it may be referred to the vicinity of that genus. The structure of the under-surface is distinctly suggestive of affinity with *Microberosiris*, but it differs in its head concealed from above, prothorax longer than wide, with the sides scarcely rounded, but obliquely decreasing in width from base to apex; the tarsi are very different, the third joint being no wider than the preceding ones (instead of much wider, as in that genus), and the claw joint is almost as long as the others

combined, instead of much shorter. I have not made certain, but believe the type to be winged, and a male.

CISOWHITEA LONGICOLLIS, n. sp.

Black; antennae of a dingy-red, club and rostrum darker. Densely clothed.

*Rostrum* about as long as prothorax, very feebly diminishing in width from base to apex; apical half without distinct punctures. *Prothorax* distinctly longer than wide, apex about half the width of base. *Elytra* about one-third wider than prothorax, and about twice as long, sides evenly decreasing in width from near base. Length, 3 mm.

*Hab.*—Moorilyanna. Type (unique), I. 5187.

The clothing is so dense that, except for the apical half of rostrum (which is entirely glabrous), the antennae and claws (which are sparsely clothed), the derm is everywhere concealed; it consists of soft scales, closely applied to the derm, and on the upper-surface varying in colour from almost white, through fawn, to sooty-black; the whitish scales are irregularly distributed, but form fairly distinct patches on each side of base of prothorax (continued on to shoulders), and a slight fascia at summit of apical slope; in addition, there are stout scales rising above the surface, fairly dense on prothorax, and forming a regular series on each interstice of elytra, but similar in colour to the other scales amongst which they are set. On the under-surface (including the whole of the pectoral canal) the scales are white; on the legs they are mostly white, but the femora are feebly ringed, and the upper parts have a speckled appearance; on the head the scales are mostly dark, irregularly changing to white on the rostrum. The type has not been abraded, so that the description of the sculpture will need amplification when a specimen is available for that purpose; punctures appear to be faintly indicated on the head and prothorax, and they are probably dense there and on the elytra; the elytral striae appear as very narrow lines, but on abrasion would probably appear much wider, and to be supplied with large punctures. From some directions the base of the prothorax appears to be truncate, but from others feebly produced in the middle. Seen from the side the upper edge of the rostrum appears to be almost level from apex to base, and to suddenly slope downwards from level with the middle of the eye; but this appearance is certainly enhanced by the clothing.

DITROPIDUS WHITEI, n. sp.

Brassy; appendages more or less brassy-black, but three basal joints of antennae and tips of mandibles obscurely diluted with red. Clothed with fine whitish pubescence,

moderately dense on head, sides of prothorax, pygidium, and under-surface, very short and rather indistinct, but almost evenly distributed on elytra and disc of prothorax, and dense on flanks of metasternum.

*Head* with rather dense but partially concealed punctures. Antennae slightly passing base of prothorax. *Prothorax* with dense punctures, except for a short, shining, median line, towards sides and base, with a tendency to become obliquely or longitudinally confluent. *Elytra* slightly narrower than widest part of prothorax; with oblique rows of distinct but not very large punctures, larger behind shoulders than elsewhere; interstices with rather dense, small punctures, having a tendency in places to become confluent. *Legs* short and stout. Length, 4 mm.

*Hab.*—Flat Rock Hole. Type, I. 5182.

In general appearance fairly close to *pubicollis*, but prothoracic punctures much more distinct, median line of the head less distinct, legs entirely black, and antennae almost so. The elytral pubescence, although extremely short, is fairly distinct from certain directions, although from others appearing like fine dust. The species occurs also at Leigh Creek (Blackburn's collection), Cue (H. W. Brown), and Fraser Range<sup>(1)</sup> (Elder Expedition). Some of the specimens have an irregular bluish or purplish gloss in places, but this may be due to grease; one has five basal joints of antennae reddish.

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## Lepidoptera.

### Suborder HETEROCERA.

By A. JEFFERIS TURNER, M.D., F.E.S.

The following species of Lepidoptera were taken by Capt. S. A. White in Central Australia "from Oodnadatta to the Musgrave and Everard Ranges":—

#### Family NOCTUIDAE.

*Neocleptria punctifera*, Wlk., three examples.

*Euxoa radians*, Gn., five examples.

One species undetermined, represented by a solitary example in poor condition. It probably represents a new genus allied to *Calophasidia*, Hmps.

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(1) A specimen from Fraser Range was identified by the late Rev. T. Blackburn as *cistellus*; but that species is entirely glabrous on the upper-surface (in the original description no clothing of any kind was mentioned), and differs in other respects.

## Family LYMANTRIADAE.

*Anthela rubicunda*, Swin., one male example.

## Family GEOMETRIDAE.

*Taxeotis*, sp. One female example.

*Boarmia*, sp. One male example, somewhat rubbed, which I am unable to identify.

HARPAGOCNEMA, n. gen. (ἄρπαγοκνημος, with hooked shins).

Frons with well-marked rounded prominence. Tongue well developed. Palpi moderately long (2), porrect; second joint thickened with scales beneath; terminal joint short, obtuse. Antennae of male shortly bipectinate, towards apex simple. Thorax with a sharp keel-shaped anterior crest, its apex bent forwards; beneath densely hairy. Abdomen smooth. Anterior tibiae very short with two stout horny apical hooks, the inner hook long, the outer very short. Posterior tibiae of male not dilated. Forewings narrow-elongate; in male without fovea; 10 and 11 long-stalked, not anastomosing. Hindwings much broader than forewings (over 2); cell long ( $\frac{2}{3}$ ).

One of the *Chlenias* group, apparently near *Capusa*, but very distinct in the stalking of veins 10 and 11, hooked anterior tibiae, sharp anterior thoracic crest, and pectinations of male antennae.

HARPAGOCNEMA EREMOPLANA, n. sp.

(ἐρημοπλανος, wandering in the desert).

♂, ♀; 39-42 mm. Head, thorax, and palpi dark-grey, irrorated with whitish; centre of face brownish-ochreous. Antennae ochreous-fuscous; pectinations in male 2, apical  $\frac{1}{3}$  simple. Abdomen ochreous-whitish, irrorated with grey. Legs whitish, irrorated with dark-fuscous; anterior pair dark-fuscous. Forewings narrow-elongate, costa gently arched towards apex, apex subrectangular, termen rather obliquely rounded, finely dentate; dark-grey, with some whitish irroration and some blackish streaks on veins; a blackish streak on dorsum from near base to tornus; cilia grey. Hindwings with termen doubly sinuate; whitish, with grey streaks on veins; a grey discal spot beyond middle; a dark-grey suffusion at apex; cilia whitish, at apex grey.

Two examples.



## Family EUPTEROTIDAE.

*Ochrogaster contraria*, Wlk., one example.

## Family LASIOCAMPIDAE.

EREMAEA, n. gen. (ἐρημαίος, of the desert).

Head with dense anteriorly projecting hairs. Palpi short, porrect. densely hairy, not reaching beyond frons. Forewings with 2 from about middle of cell, 3 from  $\frac{3}{4}$ , 4 and 5 from near angle, 6 from near upper angle, 7 and 8 connate or short-stalked, 9 and 10 stalked, 11 from before middle. Hindwings with cell open between 4 and 6, discocellular being obsolete; 7 from near base of cell, 8 anastomosing with 7 near its origin, precostal spur obsolete. Abdomen with large terminal tuft of long hairs in male.

This distinct and interesting genus belongs to the *Crexa-Pinara* group.

## EREMAEA ZONOSPILA.

*Bombyx zonospila*, Low.: Trans. Roy. Soc., S.A., 1903, p. 150.

♂, 38 mm. Head and thorax pale-grey; palpi and lower edge of face blackish. Antennae grey-whitish; pectinations in male extremely long (12), ochreous. Abdomen fuscous; base and apical tuft pale-grey. Legs grey. Forewings elongate, costa straight, apex rounded, termen rounded, moderately oblique; pale-grey, with two lines of blackish dots more or less confluent, first from  $\frac{1}{3}$  costa to dorsum before middle, second from  $\frac{2}{3}$  costa to dorsum beyond middle, the two lines converging; the first line edged posteriorly and the second anteriorly with orange-ochreous dots; cilia pale-grey. Hindwings with termen strongly rounded; fuscous; cilia pale-grey.

Two male examples. The type is from Eucla, South Australia.

## Family PYRALIDAE.

## Subfamily PHYCITINAE.

*Crocodypora cinigerella*, Wlk., two examples.

*Etiella behri*, Zel., one example.

TYLOCHARES GONIOSTICHA, n. sp. (γωνιοστιχος, with angled line).

♂, 20 mm. Head fuscous, with some whitish irroration. Palpi whitish irrorated with grey, with a fuscous ring at the apex of each joint, and a fourth on middle of second joint.

Antennae fuscous; in male thickened, without sub-basal tuft. Thorax fuscous with some whitish irroration. Abdomen ochreous-fuscous; tuft whitish-ochreous. Legs fuscous, with fine whitish irroration. Forewings narrow, costa gently arched, apex rounded-rectangular, termen rounded, scarcely oblique; fuscous-grey with some patches of brownish suffusion, towards base and apex rather thickly irrorated with whitish; a tuft of raised scales in middle at  $\frac{1}{6}$  followed by a brownish suffusion; an irregularly dentate dark-fuscous transverse line at  $\frac{1}{3}$ , edged anteriorly with whitish; a second tuft of raised scales on fold immediately following first line; a brownish spot in disc beyond middle edged anteriorly and posteriorly with dark-fuscous; a second dark-fuscous line, edged posteriorly with whitish, from  $\frac{4}{5}$  costa, at first inwards, then bent outwards, and forming a very sharp prominent tooth in disc, above tornus obscured by a brownish suffusion; a terminal series of dark-fuscous dots; cilia grey, irrorated with white. Hindwings with termen slightly sinuate; whitish, with slight grey suffusion on apex and termen; cilia whitish.

This species should be easily distinguished by the raised tufts and sharply-angled posterior line of forewings.

One example, in good condition.

#### Subfamily PYRAUSTINAE.

*Sceliodes cordalis*, Dbld., one example.

*Loxostege affinitalis*, Led., nineteen examples.

*Metasia*, sp., one example.

*Metasia*, sp., one example.

*Nomophila noctuella*, Schiff., two examples.

*Scoparia schizodesma*, Low., one example.

*Scoparia*, sp., three examples.

#### Family TINEIDAE.

##### Subfamily OECOPHORINAE.

*Macrobathra alternatella*, Wlk.(?), one imperfect example, with the tornal spot obsolete; probably referable to this species.

*Nephogenes*, sp., one example.

*Nov. gen., et sp.*(?), two wasted examples.

*Philobota*, sp., one wasted example.

*Heliocausta*, sp., one example.

##### Subfamily XYLORYCTINAE.

*Procometis*, sp., one example.

## Hymenoptera.

By WILLIAM MORTON WHEELER.

[*Contribution from Harvard University.*]

PLATES LXIV. TO LXVI.

Family FORMICIDAE.

Subfamily PONERIDES.

## 1. MYRMECIA VINDEK, F. Smith, var. DESERTORUM, n. var.

*Worker*.—Length, 15-17 mm.

Resembling the var. *nigriceps*, Mayr., in colouration, but with the red of the thorax and pedicel a shade more yellowish, and more like the typical *vindex* in size and pilosity, the latter being conspicuously more abundant than in *nigriceps*, especially on the thoracic dorsum. The sculpture of the thorax is also distinctly feebler and the surface more opaque than in this variety and the typical form.

Four workers from Todmorden.

## 2. RHYTIDOPONERA CORNUTA, Emery, subsp. TAURUS, Forel.

A single worker from Moorilyanna, agreeing very closely with a co-type in my collection.

## 3. RHYTIDOPONERA (CHALCOPONERA) METALLICA, F. Smith, var. PURPURASCENS, n. var.

*Worker*.—Length, 7 mm.

Differing from the typical *metallica* from Eastern Australia in colour, the head, thorax, petiole, and gaster being deep metallic-violet, with the legs, mandibles, and a large spot on the vertex purplish-brown, and the antennae black. The sculpture is very much like that of the typical form, except that the rugosity on the pronotum is somewhat more irregular and the fine rugae are more nearly of the same character on the first and second gastric segments.

A single worker from Moorilyanna.

## 4. BOTHROPONERA PILIVENTRIS, F. Smith.

A single worker, taken between the Musgrave Ranges and Moorilyanna.

## 5. LEPTOGENYS (LOBOPELTA) CONIGERA, Mayr., var. CENTRALIS, n. var.

*Worker*.—Length, 6.5-7 mm.

Differing from the typical form and the var. *adlerzi*, Forel, of Queensland in the following characters:—The head

is somewhat broader in the region of the eyes, and these are decidedly more convex; the epinotum is much less angular, more rounded, and sloping; the petiole in profile lower in front and with a more evenly-rounded slope rising to the highest point at the posterior end of the segment; the petiole, the penultimate antennal joints, and the hairs on the body are decidedly longer than in *adlerzi*.

♂.—Length, 6.5 mm.

Head, including the eyes, broader than long; eyes very large; cheeks extremely short. Mandibles very small, far from meeting, with rounded, edentate tips. Clypeus very convex, but not carinate, with broadly-rounded anterior border. Antennal scape as long as the second funicular joint; first funicular joint longer than broad. Thorax through the wing insertions about as broad as the head through the eyes; mesonotum without Mayrian furrows, convex, broadly elliptical, a little longer than broad, not concealing the pronotum when seen from above. Epinotum rather long, in profile sloping, the base about twice as long as the declivity. Petiole similar to that of the worker, but proportionately shorter. Gaster and legs slender. Head and thorax subopaque, punctate-rugulose; gaster more shining, distinctly shagreened. Hairs and pubescence grayish, more abundant and the hairs shorter than in the worker. Head, thorax, petiole, and gaster black; antennae dark brown; genitalia and legs brownish-yellow. Wings grayish-hyaline, with brown veins and apterostigma.

Described from a single male and eleven workers taken at Moorilyanna.

6. *ODONTOMACHUS HAEMATODA*, L., subsp. *CORIARIUS*, Mayr.

A single large worker, measuring 11.5 mm., from Moorilyanna.

Subfamily MYRMICIDES.

7. *PODOMYRMA BIMACULATA*, Forel.

Two workers from Flat Rock Hole in the Musgrave Ranges, agreeing very closely with Forel's description of the typical form from Kalgoorlie, Western Australia.

8. *MONOMORIUM ROTHSTEINI*, Forel, var. *TOSTUM*, n. var.

*Worker*.—Length, less than 2 mm.

Differing from the typical form and the vars. *humilior*, Forel, and *leda*, Forel, in colour; the head, petiole, and post-petiole being dark castaneous-brown; the thorax, antennae, and legs reddish-brown; the gaster black. The nodes of the petiole and postpetiole are lower than in the type and more

as in the var. *humilior*. The posterior margin of the head is distinctly excavated, the node of the petiole is more pointed than in the type, the epinotum proportionately smaller and more rounded and somewhat smoother and more shining above.

Two workers from the Everard Range.

9. *MONOMORIUM* (*HOLCOMYRMEX*) *WHITEI*, n. sp.

Pls. lxiv., fig. 2, and lxvi., fig. 1.

*Worker major*.—Length, 4.45 mm.

Head very large (1.3 mm. broad), subrectangular, as broad as long, nearly as broad behind as in front, with much-rounded posterior corners, straight, subparallel sides, and the posterior margin distinctly and acutely excised in the middle. Mandibles large and very convex, with four large, subequal teeth. Clypeus broad, its anterior border deeply excised in the middle, with two sharp carinae, each prolonged into a strong, acute tooth, which is flanked by a somewhat shorter and blunter lateral tooth. Frontal carina short and prominent; frontal area large, impressed, with a short median carinula behind; frontal groove distinct nearly as far as the middle of the head. Eyes very large, flat, nearly as long as the cheeks, in front of the median transverse diameter of the head. Antennae slender, 12-jointed; scapes curved at the base, slightly thickened at their tips, which extend a little beyond the posterior orbits; funiculi without a clava, all the joints longer than broad; joints 7-10 subequal, terminal shorter than the two penultimate joints taken together. Thorax broadest through the pronotum, where it is scarcely more than half as broad as the head. Pronotum very convex, almost conical in profile; mesonotum straight in profile, sloping backward to the mesoëpinotal suture, which is distinctly impressed. Promesonotal suture obsolete. Epinotum about two-thirds as broad as the pronotum, longer than broad, with subparallel sides; in profile with feebly and evenly convex base one and a half times as long as the slightly concave declivity, the two surfaces separated on each side by a distinct but blunt tubercle continued backward as a slight ridge. Petiole pedunculate, from above twice as long as broad through the node, which is rather high and conical, with very similar anterior and posterior surfaces, the former rising rather abruptly from the peduncle. Postpetiole from above somewhat broader than the petiole, about one and a half times as long as broad, in profile convex and rounded, but much lower than the petiolar node. Gaster large, broadly and regularly elliptical, somewhat flattened dorsoventrally. Legs rather long.

Surface of body, especially of the gaster, shining. Mandibles coarsely and rather obliquely rugose, and coarsely punctate along their borders. Head very finely and densely longitudinally striate and sparsely punctate, posterior corners a little smoother and more shining. Thorax, petiole, and post-petiole very finely and densely punctate and feebly rugulose on the epinotum; pronotum somewhat smoother and more shining on the middle above. Gaster and legs glabrous, shining, with fine, scattered, piligerous punctures. Hairs yellowish, coarse, bristly, rather long, erect, and moderately abundant on the body; shorter, oblique, and more numerous on the legs. Gula without a psammophore. Ferruginous-red; clypeus, frontal area, extreme anterior corners of the head, and the mandibular teeth black; gaster and legs paler than the remainder of the body, yellowish-red.

Described from four specimens taken at Flat Rock Hole in the Musgrave Ranges.

This species is very peculiar in having large eyes and two pairs of powerful teeth on the clypeus. The subgenus *Holcomyrme* was supposed to be confined to North Africa, Asia Minor, and the Indian Region till Viehmeyer recently described from a worker minor a species (*H. foreli*) from Killalpaninna, South Australia. Although I have seen only major workers of *H. whitei*, I do not believe that they can be co-specific with *foreli*, for this form has no teeth on the clypeus, the gula bears a psammophore, the head is not sculptured above and behind, and the colour is very different, being described as chestnut-brown, with the head and gaster darker, the segments of the latter bordered with yellow, etc. *H. whitei* is undoubtedly a harvesting ant, like its North African and Indian congeners. The nests, of which Captain White secured an interesting photograph, are craters of a very peculiar, chimney-like form.

#### 10. CREMATOGASTER WHITEI, n. sp.

*Worker*.—Length, 2 mm.

Head slightly broader than long, convex above, sub-rectangular, as broad in front as behind, with rather convex sides, rounded posterior corners, and feebly excised posterior border. Mandibles narrow, apparently 4-toothed. Clypeus very convex, with nearly straight anterior margin. Frontal area and groove absent; frontal carinae very short. Eyes moderately convex, their anterior orbits at the middle of the sides of the head. Antennae 11-jointed; scapes reaching a little beyond the posterior orbits; funicular joints 2-7 small, as broad as long; club 2-jointed, its basal about half as long

as its terminal joint. Thorax very short and robust, nowhere marginate; pronotum and mesonotum together as broad as long, not separated by a suture and without a median carina, trapezoidal, rapidly tapering behind, with rounded humeri; in profile about as long as high, somewhat flattened dorsally; mesoëpinal constriction narrow and pronounced. Epinotum short, broader than long, with the base flat and shorter than the declivity, the spines as long as the base, slender, parallel, acute, directed backward, and very slightly upward. Petiole a little longer than broad, a little broader in front than behind, with broadly-rounded anterior corners and straight sides. Postpetiole transverse, convex, without any trace of a median furrow, but distinctly emarginate behind. Gaster large, with straight anterior border. Legs rather slender.

Head, thorax, and pedicel opaque; mandibles very finely and densely longitudinally striated; head, thorax, and pedicel very finely, densely, and uniformly punctate; clypeus, front, and cheeks also finely longitudinally rugulose. Gaster shining, very finely and superficially reticulate. Hairs white, long, and erect on the clypeus and venter, short and almost absent on the upper-surface of the body, very minute, scattered and appressed on the scapes and legs. Pubescence very sparse and rather long, most distinct on the gaster. Dark-brown; gaster black; mandibles, antennae, and legs brownish-yellow, middle portions of femora and tibiae brown.

Described from a single worker taken in the Everard Range.

This species is easily distinguished from any of the other known Australian species of the genus by its peculiar sculpture. It seems to resemble *C. mjöbergi*, Forel, from Kimberley, North-western Australia, judging from the description; but this species has a three-jointed antennal club, the head is smooth and shining, and the mesonotum has a median longitudinal impression.

#### 11. CREMATOGASTER LONGICEPS, Forel, var. CURTICEPS, n. var.

*Worker*.—Differing from the typical *longiceps* in the shape of the head and in its much darker colour. The head is only as long as broad and very nearly rectangular, with straight, parallel sides and very feebly concave posterior border. Above it is very shining, but covered with minute, scattered punctures. The body is reddish-brown throughout, except the gaster, which is black. The absence of pilosity is as conspicuous as in the type. There are, however, several long, slender hairs on the gula and clypeus, and the pubescence on the head and gaster is rather long, but very dilute.

Sixteen workers from Ellery Creek in the MacDonnell Ranges. The typical *longiceps* is also taken in Central Australia (Tennant Creek).

12. CREMATOGASTER XEROPHILA, n. sp.

*Worker*.—Length, 2.5-2.8 mm.

Head subrectangular, very little broader than long, with straight, parallel sides and posterior border. Eyes rather convex, behind the median transverse diameter of the head. Mandibles narrow, apparently 4-toothed. Clypeus very convex, with straight, entire anterior margin. Frontal carinae extremely small; frontal area distinct, triangular; frontal groove short and rather indistinct. Antennae 11-jointed; scapes reaching a little beyond the posterior border of the head; funiculus with a 2-jointed club; joints 3-8 as broad as long. Thorax rather small and narrow; promesonotal suture indistinct or obsolete; pronotum and mesonotum bluntly margined on the sides, together as broad as long, with broadly-rounded humeri, rapidly narrowing behind to the mesoëpinotal constriction, which is pronounced. In profile the dorsal surface is flattened and the mesonotum without a carina, falling rather abruptly behind to the mesoëpinotal suture. Epinotum with a very short base and a large, concave declivity between the spines, which are broad at the base, rapidly tapering and acute, as long as the base of the epinotum, laterally compressed and directed outward, upward, and backward. Petiole distinctly longer than broad, as broad behind as in front, with straight parallel sides, much rounded anterior and slightly rounded posterior corners. In profile it is wedge-shaped, narrow in front, with straight ventral and dorsal surfaces. Postpetiole globose, as broad as the petiole, without a trace of a longitudinal furrow or posterior emargination. Gaster acutely pointed, with straight anterior border.

Shining; mandibles and clypeus longitudinally rugulose; cheeks and sides of front finely striated, remainder of head glabrous, with fine, scattered, piligerous punctures. Thorax more opaque, its sides finely and densely punctate-rugulose, upper-surface of pronotum and mesonotum very coarsely and reticulately rugose. Concavity of epinotum shining, superficially and finely punctate. Petiole, postpetiole, and gaster smooth and shining. Hairs yellowish, sparse, slender, and tapering, erect on the body, short and appressed on the appendages. Anterior surfaces of the antennal scapes with a few erect hairs. Pubescence absent on the body. Chestnut-brown; head and gaster blackish; femora and tibiae darker than the thorax. In one specimen the thorax is as dark as the head. Described from five workers taken at Moorilyanna.



This species is quite distinct from any of the described Australian *Crematogaster*s in the shape of the petiole and the very pronounced sculpture of the thorax.

13. *CREMATOGASTER XEROPHILA*, var. *EXIGUA*, n. var.

*Worker*.—Length, 1.5-1.7 mm.

Differing from the typical form in its smaller size, in the shorter antennal scapes, which scarcely reach beyond the posterior border of the head, and the differently shaped petiole and postpetiole. The petiole is scarcely longer than broad and a little broader behind than in front; the postpetiole has a distinct trace of a longitudinal furrow. The median funicular joints are a little more transverse. The head, scapes, and gaster are black, the thorax, petiole, and legs brown, the funiculi yellowish-brown.

Two workers from Moorilyanna.

Subfamily DOLICHODERIDES.

14. *IRIDOMYRMEX DETECTUS*, F. Smith, var. *VIRIDIAENEUS*,  
Viehmeyer.

This very handsome variety of one of the commonest Australian ants was recently described from Killalpaninna, South Australia. The body of the worker is deep metallic-green, sometimes with aeneous or violet reflections on the gaster. The mandibles, anterior border of head, antennae, and tarsi are ferruginous, the legs purplish-red. Among the material collected by Captain White are three workers from the Everard Range, one from Flat Rock Hole in the Musgrave Ranges, and a dealated female from Todmorden. The female is poorly preserved and very greasy, but seems to agree very closely in size, structure, and colouration with the female of the typical *detectus*. According to a note accompanying the specimens the nest of the var. *viridiaeneus* has a slit-shaped orifice.

15. *IRIDOMYRMEX DISCORS*, Forel, var. *AENEOGASTER*, n. var.

*Worker*.—Differing from the typical *discors* in colour and pubescence.

The head and thorax are deep-red, the antennae and legs dark-brown, the gaster with bronzy- instead of metallic-green reflections. The pubescence covering the body and appendages is decidedly more abundant, so that the whole surface seems to be more opaque. The head is shaped much as in the type, and is, if anything, a little larger and broader behind, approaching the condition in the subspecies *occipitalis*, Forel,

but this and its var. *exilior*, Forel, are even paler in colour than the typical *discors*. The new variety is very close to var. *obscurior*, Forel, from Victoria, in pubescence, but this form is brownish-yellow, with the head and gaster brown, the latter with feeble metallic-green reflections.

A single worker from Flat Rock Hole in the Musgrave Ranges.

16. IRIDOMYRMEX CYANEUS, n. sp.

*Worker*.—Length, 1.5-1.7 mm.

Head a little longer than broad, as broad behind as in front, broadest in the middle through the convex sides. Posterior border nearly straight. Eyes rather large, feebly convex, in the median transverse diameter of the head. Mandibles small, retracted under the clypeus, which is very convex, with feebly and sinuately excised anterior border. Frontal area distinct, triangular; frontal carinae short; frontal groove absent. Antennal scapes extending to the posterior border of the head, funicular joints 2-10 slightly broader than long, first joint three times as long as broad. Thorax much narrower than the head, rather short; pronotum convex, evenly rounded, as broad as long; mesonotum a little broader than long, sloping, straight in profile; mesoëpinotal constriction short and deep; epinotum with a very convex, almost conical base, rising rather abruptly from the mesoëpinotal suture and falling behind into the rather steep and straight declivity. Petiole inclined forward, elliptical from behind, with rounded, entire apical border, narrower than the epinotum and about half as high. Gaster of the usual shape. Legs rather slender.

Surface of body shining, very finely but distinctly shagreened. Hairs whitish, absent except on the clypeus; pubescence extremely fine and appressed, visible only on the appendages. Body deep metallic-blue, antennae and legs piceous-black.

Two workers, one from Black Rock Hole in the Musgrave Ranges and one from Moorilyanna.

This species resembles *I. innocens*, Forel, in the shape of the thorax and petiole, but the head is of a very different shape, the antennal scapes and mesonotum are much shorter and the body is pilose and metallic.

17. IRIDOMYRMEX RUFONIGER, Lowne, var.

A single worker from Moorilyanna is very close to the var. *domesticus*, Forel, but is smaller (2.5 mm.). It may represent a distinct variety, but the material is insufficient to justify the introduction of a new name.

## 18. IRIDOMYRMEX GRACILIS, Lowne, supsp. SPURCUS, n. subsp.

Worker.—Length, 2.4-2.6 mm.

Differing from the typical *gracilis* in its much smaller size, in lacking all metallic reflections, and in having the petiole much more compressed anteroposteriorly, and therefore more acute at the apex. The pilosity and pubescence are somewhat less abundant, and the surface of the body is therefore more shining.

Three specimens, taken at Moorilyanna. These are not well preserved. More satisfactory material may show that this form is really a distinct species.

## Subfamily CAMPONOTIDES.

## 19. MELOPHORUS LATICEPS, n. sp.

Pl. lxvi., fig. 2.

♀. Length, 8 mm.

Head, excluding the mandibles, nearly twice as broad as long, subrectangular, with rounded posterior corners and nearly straight posterior border. Eyes small, convex, just behind the median transverse diameter of the head. Ocelli very small and close together. Mandibles large, with oblique, coarsely 4-toothed blades, which are curiously prismatic, with two flattened planes on their upper-surfaces, meeting at an angle formed by a coarse ridge from the base to the third tooth from the apex. Clypeus very short and broad, feebly convex, with straight, entire anterior and curved posterior border. Frontal carinae very small; frontal area large but indistinct; frontal groove distinct, especially just in front of the ocelli. Antennae slender, scapes not reaching to the posterior border of the head; first funicular joint as long as the three succeeding joints together; joints 2-5 nearly twice as long as broad, remaining joints shorter, except the last, which is twice as long as the penultimate. Thorax very short and thickset, less than one and a half times as long as broad, and but little longer than high. Mesonotum evenly convex, nearly one and two-third times as broad as long. Epinotum very short, steep in profile, without distinct base and declivity, rounded and slightly convex above, more flattened below. Petiole small, thickened below, rapidly attenuated and narrowed above where the compressed border terminates in two flat teeth. Gaster large, broadly elliptical, somewhat flattened above. Wings as long as the body (8 mm.).

Very smooth and shining; mandibles coarsely and regularly longitudinally rugose; gaster finely shagreened. Gula and clypeus with very long, curved, yellow hairs, forming a distinct psammophore. Hairs shorter and very sparse on the

remainder of the body; legs with abundant, short appressed hairs; those on the scapes similar, but even shorter. Mandibles deep-red; head, thorax, and petiole bright yellowish-red; gaster black; anus, transverse bands on the venter, the legs, and antennae yellow. Wings distinctly yellowish, with pale-brown veins and apterostigma.

A single specimen, taken between Todmorden and Wantapella. This may be the hitherto unknown female of *M. wheeleri*, Forel, originally described from Tennant Creek, Central Australia.

20. CAMPONOTUS (MYRMOTURBA) MACULATUS, Fabr., subsp.  
NOVAE-HOLLANDIAE, Mayr.

Numerous workers from Flat Rock Hole in the Musgrave Ranges. These are a little more hairy and somewhat larger than specimens from New South Wales, but hardly represent a distinct variety.

21. CAMPONOTUS (MYRMOTURBA) MACULATUS, Fabr., subsp.  
DISCORS, Forel.

One major and three minor workers from Flat Rock Hole in the Musgrave Ranges agree very closely with Forel's description of specimens from Pera Bore, New South Wales. The thorax of the major is much like that of the var. *laetus*, Forel, from Tennant Creek, Central Australia, but the colour is that of the typical form of the species.

22. CAMPONOTUS (MYRMOTURBA) LATRUNCULUS, n. sp.  
Pl. lxvi., figs. 3 and 4.

*Worker major*.—Length, about 9 mm.

Head large, not longer than broad, broader behind than in front, very convex above, with the posterior border nearly straight and the sides convex. Eyes rather large and convex. Mandibles convex, 6-toothed. Clypeus feebly, but distinctly, carinate, its anterior border projecting as a short, rather narrow lobe, with straight median border and the sides rather broadly emarginate. Frontal area distinct, transverse, diamond-shaped; frontal groove distinct, frontal carinae moderately far apart, curved and diverging behind. Antennae rather slender, scapes extending about one-fifth their length beyond the posterior border of the head. Thorax robust, with distinct promesonotal and mesoepinotal sutures, pronotum as broad as long, convex, rounded above; mesonotum also convex, continuing the curve of the pronotum. There is a distinct but slight constriction of the thorax at the mesoepinotal suture, behind which the rather narrowed and only

slightly compressed epinotum descends with a rounded slope, lacking a distinct base and declivity. Petiole small and narrow, in profile cuneate, with convex ventral and anterior and flat posterior surface; apical border rather sharp, bluntly pointed when seen from behind. Gaster broadly elliptical. Legs rather slender, hind tibiae cylindrical.

Smooth and shining; mandibles sparsely and not very coarsely punctate; remainder of body finely shagreened; cheeks and gaster sparsely punctate. Hairs yellow, erect, sparse on the body and along the flexor surfaces of the femora and at their tips. Hind tibiae with several rows of bristles on their flexor surfaces. Pubescence very fine and dense, visible only on the sides of the thorax and on the appendages. Chestnut-red; antennal scapes blackish; gaster black, with yellowish margins to the segments. Legs yellowish-brown.

A single specimen from Todmorden.

I am unable to refer this ant to any of the Australian species described by previous writers. The thorax feebly approaches that of *C. (Myrmosphincta) intrepidus*, Kirby, in shape, but the form of the head and clypeus show that it belongs more properly in the subgenus *Myrnoturba*.

### 23. CAMPONOTUS (MYRMOGONIA) EREMICUS, n. sp.

Pl. lxvi., figs. 5 and 6.

*Worker major*.—Length, 7 mm.

Head trapezoidal, longer than broad, broader behind than in front, with straight, transverse posterior border and feebly convex cheeks. Eyes large, convex, their anterior orbits at the middle of the sides of the head. Mandibles 6-toothed, their outer margins straight at the base, strongly convex at the tips. Clypeus strongly carinate, its anterior border not produced or lobed, feebly and sinuately excised in the middle. Frontal area small, triangular, indistinct; frontal groove distinct; frontal carinae closely approximated anteriorly, curved, and more diverging behind. Antennae slender, scapes reaching about two-fifths of their length beyond the posterior corners of the head. Pronotum as broad as long, flattened above, with a sharp semicircular ridge around its anterior surface, and extending back to the middle of its sides. Promesonotal suture pronounced; mesoëpinotal suture absent, the mesonotum and epinotum together twice as long as broad, so compressed laterally as to be reduced dorsally to a rather sharp, blade-like edge. In profile the mesoëpinotum is as high as long, the dorsal edge feebly and evenly convex and as long as the declivity, which is abrupt and feebly concave. Petiole rather narrow, cuneate in profile, thick below, with a distinct ventral protuberance, feebly convex anterior

and straight posterior surface, and sharp apical border, which seen from behind is rounded and entire. Gaster of the usual shape. Legs rather slender; tibiae cylindrical.

Shining; thorax slightly more opaque. Mandibles rather coarsely punctate; head and thorax densely punctate-reticulate, gaster very finely, transversely rugulose. Hairs erect, short, very sparse, present only on the mandibles, clypeus, front, and venter. Femora with a few bristles at their tips: tibiae with a sparse row of bristles along their flexor surfaces. Pubescence absent on the body, very short, sparse, and appressed on the tibiae and scapes. Black; mandibles, clypeus, cheeks, and front deep-red; antennae and tarsi reddish-brown; coxae, femora, and tibiae yellow; knees infuscated.

*Worker minor*.—Length, 5.5-6 mm.

Body slender; head subrectangular, about as broad behind as in front, nearly one and a half times as long as broad, with straight posterior and lateral borders. Eyes large and prominent, situated at a distance less than their length from the posterior corners of the head. Clypeus carinate, its anterior border entire, subangularly produced in the middle. Antennae very slender, reaching nearly half their length beyond the posterior corners of the head. Thorax very long, narrow, and low, less compressed behind than in the major worker, in profile evenly rounded, highest in the middle, pronotum not marginate in front and on the sides, epinotum without distinct base and declivity, but merely continuing the gentle curve of the mesonotum. Petiole with its anterior surface more convex and its upper-border more transverse than in the major worker. Gaster small and narrow.

Sculpture much as in the major worker, but thorax more shining and cheeks sparsely and feebly foveolate. Pilosity much more abundant than in the large worker. There are very sparse, erect hairs on the whole upper-surface, including the petiole, and also on the gula. The head is covered with sparse and rather long yellowish pubescence. Head and thorax brown, petiole and gaster black; scapes and legs, except the tarsi, yellow, the latter and the anterior half of the head pale-brown.

Described from a single major and three minor workers from the Everard Range. As all of these specimens were glued on the same card it would seem that they must have been taken from the same nest. The major and minor workers, however, differ in so many important particulars as to suggest some doubt as to their being co-specific.

This species is very closely related to *C. (Myrmogonia) michaelsoni*, Forel, from South-western Australia, judging

from Forel's description, but differs in so many details of structure, sculpture, and colour that I have felt constrained to describe it as new. It is more easily distinguished from the other Australian species of the subgenus *Myrmogonia*: *evae*, Forel; *oetheri*, Forel; *adami*, Forel; *lownei*, Forel; *gibbinotus*, Forel; and *rubiginosus*, Mayr.

24. CAMPONOTUS (DINOMYRMEX) SUBNITIDUS, Mayr.

To this species I refer a single minor worker taken between Todmorden and Wantapella. It is, however, even less pilose than the typical *subnitidus*, and probably represents a distinct variety, which cannot be satisfactorily described till the worker major is brought to light.

25. CAMPONOTUS (MYRMAMBLYS) AUROFASCIATUS, n. sp.

Pl. lxvi., fig. 7.

Worker (*medio* [?]).—Length, 5.5 mm.

Head strongly trapezoidal, very slightly longer than broad, broader behind than in front, with straight posterior border and sides and rather sharp posterior corners, convex in the middle above, feebly depressed behind. Eyes moderately large, convex, nearly circular, well behind the median transverse diameter of the head. Mandibles with rather straight external borders, 6-toothed. Clypeus distinctly but bluntly carinate, with feebly rounded, entire anterior border. Frontal area obsolete, frontal groove distinct, frontal carinae approximated anteriorly, curved and diverging behind. Antennae long, scapes extending nearly half their length beyond the posterior border of the head. Thorax through the pronotum nearly as broad as the head, rapidly narrowed and laterally compressed behind, so that the mesonotum and epinotum are reduced above to a rounded ridge. Pronotum broader than long, flat above, anteriorly and laterally distinctly submarginate. In profile the thorax is highest in the mesonotal region and the dorsal outline is an even curve continued over the epinotal base, which is fully three times as long as the declivity. The angle separating the base from the declivity is rounded and obtuse. Promesonotal suture distinct, that between the mesonotum and epinotum obsolete. Petiole thick and rather narrow, very convex in front, flat behind, with blunt, evenly-rounded, and entire apical border. Gaster broadly elliptical, rather flattened. Hind tibiae slightly compressed.

Opaque and very densely and finely punctate: mandibles slightly shining, with numerous large, elongate punctures. Clypeus and cheeks with a few sparse, shallow foveolae. The

dense punctuation of the gaster is distinctly finer than that of other portions of the body. Hairs golden-yellow, erect, moderately long, not abundant, rather obtuse, most conspicuous on the upper-surface of the head, epinotum, and gaster. Pubescence yellow, very sparse, and rather long, distinct on the head, especially on the clypeus, gaster, and appendages. Tips and flexor surfaces of femora with a few long, erect hairs. Black: apical portions of mandibles deep-red; each gastric segment with a conspicuous dull-golden band on its posterior border.

Described from six workers, five from the Musgrave Ranges and one from Moorilyanna. This beautiful species is readily distinguished by its peculiar head, very opaque surface, and the unusual banding of the gaster.

26. CAMPONOTUS (MYRMOSPINCTA [?]) WHITEI, n. sp.

Pl. lxvi., fig. 8.

*Worker (minor [?]).*—Length, 4.5-5 mm.

Head trapezoidal, deepest in the frontal region, a little longer than broad, slightly broader behind than in front, with straight sides and feebly concave posterior border. Eyes moderately large, very convex, nearly circular, distinctly behind the median transverse diameter of the head. Mandibles with slightly convex external borders and oblique, 6-toothed apices. Clypeus strongly carinate, rather convex, with entire anterior border, subangularly produced in the middle. Frontal area rather large, triangular; frontal groove lacking; frontal carinae approximated in front, curved outward in the middle, and again approximated behind. Antennae rather long and stout; scapes surpassing the posterior border of the head by fully two-fifths their length. Thorax rather long, nearly as broad as the head through the pronotum, which is flattened above, bluntly marginate anteriorly, and seen from above a little broader than long. Promesonotal suture pronounced. There is a deep, saddle-like impression in the region of the mesonotal suture, which is obsolete, and the thorax is also laterally compressed in this region. The epinotum is very convex and rounded, and resembles somewhat that of a *Dolichoderus*, but in profile the base passes without an angle into the vertical, slightly concave declivity of about the same length. Petiole nodiform, seen from above regularly, transversely elliptical, and about twice as broad as long, in profile less than twice as high as long, the node with three surfaces, a short vertical anterior, a horizontal rounded dorsal, and a vertical posterior surface. Gaster rather small, broadly elliptical. Tibiae cylindrical.



Mandibles shining, very coarsely punctate. Remainder of body, including the appendages, opaque; head, thorax, and petiole densely and beautifully coarsely punctate, the punctures being somewhat smaller on the upper-surface of the head and somewhat larger on the mesopleurae. Gaster and legs very minutely and densely punctate. Hairs whitish, erect, blunt, but not very stiff, rather long but not abundant, most conspicuous on the front, epinotum, and first gastric segment. Legs and scapes with more numerous, more pointed, shorter, and suberect hairs. Deep castaneous-red, mandibles and legs paler, upper-surface of head and thorax somewhat darker, gaster black, with narrow, sordid, yellowish margins to the segments.

This beautiful species, described from two specimens, was taken at Flat Rock Hole in the Musgrave Ranges. I have placed it in the subgenus *Myrmosphincta* with many misgivings. It would seem to belong more properly in *Orthonotomyrmex*, near *mayri*, Forel, on account of the peculiar structure of the thorax and petiole, but this subgenus, though confined to the Old World, is not known to be represented in Papua or Australia.

27. CAMPONOTUS (MYRMOSPINCTA [?]) LEAE, n. sp.

Pl. lxvi., fig. 9.

*Worker minor*.—Length, 4.5 mm.

Head, including the mandibles, subelliptical, longer than broad, with straight, subparallel sides, slightly broader behind through the eyes than at the mandibular insertions. Behind the eyes, which are very convex and hemispherical, the head narrows rapidly to a short occipital border, so that it has no posterior corners. Mandibles with straight external and oblique apical borders, the latter armed with at least five coarse teeth. Clypeus convex, strongly carinate, its anterior border slightly impressed in the middle. Frontal area triangular, distinct, impressed; frontal groove replaced by a rather strong raised line or ridge; frontal carinae not widely diverging behind. Antennae long, scapes extending nearly half their length beyond the posterior border of the head; all the funicular joints decidedly longer than broad. Thorax long and slender; seen from above the pronotum is as broad as long, a little narrower than the head, with rounded, sloping humeri; the mesonotum and epinotum narrower, with subparallel sides, the mesonotum as long as the epinotum, but the suture obsolete between them; promesonotal suture well developed. In profile the upper-surface of the mesonotum is straight and slopes gradually to the base of the epinotum, where the thorax is feebly but distinctly constricted. In profile the base of the

epinotum is horizontal and only slightly convex, more than twice as long as the sloping declivity into which it passes through a very obtuse angle. Petiole of extraordinary shape, longer than high, anteriorly and posteriorly cylindrical, but surmounted in the middle by a thick node which, viewed from above, is nearly circular, but is diamond-shaped in profile, its anterior surface being straight and inclined obliquely upward and forward, the dorsal surface horizontal and very feebly convex, and the posterior surface straight and inclined obliquely backward and downward and parallel with the anterior surface. The ventral surface is almost straight. Gaster broadly pyriform, narrowed, and rather pointed in front. Legs slender; tibiae cylindrical.

Opaque, except the gaster, which is distinctly shining. Mandibles very finely shagreened and coarsely punctate. Head, thorax, and petiole uniformly and densely punctate, legs and gaster coarsely, transversely shagreened. Hairs white, long, slender, pointed, and erect, most abundant on the upper-surface of the head, epinotum, petiole, and gaster, somewhat shorter on the scapes and legs. Deep-red; mandibles and femora more yellowish-red; mandibular teeth, anterior corners of head, front, and vertex between the carinae and eyes and back as far as the occipital border, articulations of antennal funiculi, the whole gaster, basal portions of petiole, coxae, and apical third of femora, black; tibiae and tarsi reddish-brown, the tips and bases of the tibiae darker.

Described from two specimens taken at Flat Rock Hole in the Musgrave Ranges.

This remarkable species, easily distinguished by its singular thorax and even more singular petiole and striking colouration, is quite as difficult as the preceding species to assign to any of Forel's subgenera of *Camponotus*. I have placed it in *Myrmosphincta* with a query because the thorax is distinctly constricted, and because there seems to be no place for it in any of the other subgenera. Whether or not it should constitute the type of a new subgenus can be determined only after the discovery of the major worker.

28. CALOMYRMEX SPLENDIDUS, Mayr., subsp. PURPUREUS,  
Mayr., var. SMARAGDINUS, Emery.

A single worker from Flat Rock Hole in the Musgrave Ranges.

29. CALOMYRMEX SPLENDIDUS, Mayr., subsp. PURPUREUS,  
Mayr., var. EREMOPHILUS, n. var.

*Worker*.—Differing from the preceding variety in the colouration of the legs and the antennae, which are black

instead of red, without metallic reflections. The head and thorax are beautiful metallic green, the gaster black, the mesopleurae and fore coxae metallic-purple as in the var. *smaragdinus*.

Seven workers, four from the Everard Range and three from Flat Rock Hole in the Musgrave Ranges.

30. POLYRHACHIS (CAMPOMYRMA) LONGIPES, n. sp.

Pls. lxx., figs. 1 and 2, and lxxvi., fig. 10.

*Worker*.—Length, 9-10 mm.

Head subrectangular, excluding the mandibles, a little broader behind than in front, with straight sides and rather sharp, distinctly marginate posterior corners, the occipital region convex in the middle, the frontal region convex, and the vertex rather flat. Eyes large and convex, situated a distance about equal to their longest diameter from the posterior corners of the head. Mandibles with moderately convex external and 5-toothed apical borders. Clypeus distinctly carinate, produced in the middle as a rounded lobe, bearing at its edge a row of regular, fine, acute teeth, its sides broadly excised. Frontal area small, triangular, impressed; frontal groove distinct; frontal carinae closely approximated in front, gradually diverging behind, nearly straight. Antennae very long and slender, scapes reaching fully half their length beyond the posterior border of the head; first funicular joint more than five times as long as broad, remaining joints growing successively shorter. Thorax long, its dorsal surface flattened and but slightly convex in profile, very sharply marginate on the sides, so that the pleurae are slightly concave, the margin rather deeply incised at the pronounced promesonotal and only feebly indented at the distinct mesoepinotal suture. Pronotum as long as broad, a little narrower behind than in front, its anterior corners in the form of small acute teeth, which are as long as broad at their bases. Mesonotum a little longer than broad, narrower behind than in front, with evenly rounded anterior and lateral borders; base of epinotum longer than broad, rather narrow, especially behind, where it is produced into two parallel, flat, blunt teeth, which are longer than broad at their bases, as long as their distance apart, and directed backward and upward. The small notch-like space between the teeth is not marginate. Declivity of epinotum shorter than the base, sloping, feebly convex. Petiole thick at the base, when seen from above as long as broad, with convex anterior and posterior surfaces, the apical border compressed and bearing four long, slender, acute spines, directed upward and backward, the inner pair approximated and shorter, so that an imaginary line joining the tips

of all four spines would be straight. Ventral surface of petiole distinctly concave. Gaster broadly elliptical, convex above and below, first segment occupying nearly half of its surface. Legs very long and slender; tibiae cylindrical.

Mandibles lustrous, very finely and densely striated; remainder of body subopaque; head, thorax, and petiole very finely punctate-rugulose, the rugules distinctly longitudinal and regular on the posterior portion of the head and on the thoracic dorsum. Gaster and legs very densely shagreened, and covered with small, sparse, piligerous punctures. Hairs yellowish, erect, short, and sparse, almost absent on the upper-surface, except on the clypeus, mandibles, and gaster; very distinct, more abundant, shorter, and bristly on the scapes and legs; pubescence absent except on the venter, where it is yellowish, long, sparse, and appressed. Black; mandibles and apical halves of the funiculi brownish-red; legs, including the coxae, brownish-yellow, with the tarsi and basal half of the tibiae black.

Described from twenty-four workers taken in the Everard Range.

This species, though apparently related to *P. (C.) froggatti*, Forel, and *pyrrhus*, Forel, is readily distinguishable from these and all other known Australian members of the subgenus, by its regularly dentate (not crenate) clypeus, very long appendages, and the shape of the petiolar and epinotal spines. It appears also to be very distinct in its habits. Like the other species of *Campomyrma*, it lives in the ground, but Captain White's photographs show that instead of nesting under stones, like *P. femorata*, F. Smith, *micans*, Mayr., and *sydneyensis*, Mayr., of Eastern Australia, it builds a beautifully regular crater, the rounded, exposed surfaces of which it thatches with a layer of mulga leaves.

### 31. POLYRHACHIS (CAMPOMYRMA), sp.

A single dealated female specimen, measuring about 6.5 mm., from the MacDonnell Ranges, evidently belongs to a species allied to *laeae*, Forel, or *micans*, Mayr., but as the females of the great majority of Australian *Campomyrmas* are quite unknown I refrain from describing it at the present time.

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## DESCRIPTION OF PLATES.

[*Plates lrv. and lrvii. are from photographs taken by S. A. White.*]

### PLATE LXIV.

Fig. 2.—Several ants' nests, constructed of clay, belonging to a new species, *Monomorium (Holcomyrma) whitei*, Wheeler.

## PLATE LXV.

Fig. 1.—An ants' nest, covered with mulga leaves, belonging to a new species, *Polyrhachis (Campomyrma) longipes*, Wheeler.

Fig. 2.—The same at nearer view.

## PLATE LXVI.

- Fig. 1. *Monomorium (Holcomyrma) whitei*, Wheeler.  
 ,, 2. *Melophorus laticeps*, Wheeler, head.  
 ,, 3. *Camponotus (Myrmoturba) latrunculus*, Wheeler, head.  
 ,, 4. ,, ,, ,, ,, Wheeler, side view of thorax.  
 ,, 5. ,, (*Myrmogonia*) *eremicus*, Wheeler, head.  
 ,, 6. ,, ,, ,, ,, Wheeler, side view of thorax.  
 ,, 7. ,, (*Myrmamblys*) *aurofasciatus*, Wheeler.  
 ,, 8. ,, (*Myrmosphincta* [?]) *whitei*, Wheeler.  
 ,, 9. ,, ,, ,, *leae*, Wheeler.  
 ,, 10. *Polyrhachis (Campomyrma) longipes*, Wheeler.

## (j) BOTANY.

By J. M. BLACK.

## PLATES LXIX. AND LXX.

This list comprises 200 species collected by Capt. White.

The following have been previously recorded for Central Australia (Northern Territory), but not for South Australia Proper:—*Swainsona canescens*, *Acacia cibaria*, *Eucalyptus pachyphylla*, *Olearia Ferresii*, *Calotis Kempei*, *Helipterum Charsleyae*, and *H. Fitzgibbonii*. New species for Tate's "Central District" (in the north-western corner of which are situated the Musgrave and Everard Ranges) are:—*Eragrostis lacunaria*, *E. Brownii*, *Cyperus exaltatus*, *Bassia longicuspis*, *Chenopodium microphyllum*, *Haloragis odontocarpa*, *Myoporum deserti*, *Waitsia corymbosa*, *Podocoma nana*, *Helipterum Tietkensii*, and *Gnaphalium japonicum*.

Four species are described which are believed to be new to science (in the genera *Triodia*, *Menkea*, *Pterigeron*, and *Toranthus*), and also a variety of the Native Tobacco (*Nicotiana suaveolens*).

Only two botanical collections of importance have been previously made in the region between Oodnadatta and the Musgrave Ranges. The first was that of Ernest Giles in his exploration of 1876, and the second was that of R. Helms, collector to the Elder Expedition of 1891. Giles' plants were dealt with by Baron von Mueller in the "Journal of Botany," xv., 269-281, 300-6, 344-9 (1877), and Helms'

specimens (phanerogams and vascular cryptogams) were identified by Mueller and Tate in the Transactions of this Society, xvi., 333-83 (1892).

The positions of the minor localities mentioned in this report are as follows:—Coongra Creek, a branch of the Alberga Creek; Indulkana Springs, in the Indulkana Range, at the head of the Indulkana Creek; Lambinna Soakage, on the Alberga, about 40 miles west of Todmorden Station; Flat Rock Hole, about 16 miles east of the Musgrave Ranges; Moorilyanna Native Well, between the Musgrave Ranges and the Indulkana Range; Mount Carmeena, the second highest peak of the Everard Range; Mount Illbillie, highest peak in the Everard Range; Wantapella Swamp, just south of the Indulkana Range; Vaughan Hill, south of Alberga Creek, near Lambinna Soakage.

The additions between brackets are Capt. White's field notes.

POLYPODIACEAE.—*Notholaena vellea*, R. Br. Glen Ferdinand, Musgrave Ranges; Indulkana Springs and 15 miles west thereof. [A few plants here and there amongst the rock in the most protected places had resisted the drought.] *Cheilanthes tenuifolia*, Swartz. Moorilyanna Native Well. [Found amongst all the granite outcrops and ranges.] *Grammitis Reynoldsii*, F. v. M. Mount Illbillie, Everard Range. [A few specimens found in damp places.]

CONIFERAE.—*Callitris robusta*, R. Br. "Murray Pine." Tietkens' Birthday Creek, Musgrave Ranges. [First met with in the Indulkana Range at Indulkana Springs. Growing in great quantity amongst the rocks in Glen Ferdinand; also met with in the Everard Range. It does not grow to anything like a fair-sized tree.]

GRAMINEAE.—*Panicum gracile*, R. Br. Moorilyanna Native Well. [Not often seen.] *P. leucophaeum*, H. B. et K. Moorilyanna Native Well. [Found growing amongst the rocks; much eaten down by mammals.] *Neurachne Mitchelliana*, Nees. Moorilyanna Native Well. *Eriachne ovata*, Nees. Forty miles west of Oodnadatta. *E. pallida*, F. v. M. Musgrave Ranges. [A very common erect grass growing in valleys between the ranges.] These two determinations are not altogether satisfactory, and it is evident from these and other Northern specimens that the genus *Eriachne* requires a careful revision. *Danthonia bipartita*, F. v. M. Twenty miles east of Musgrave Ranges; Everard Range. [Not a common grass; much relished by stock.] *Pollinia fulva*, Benth. Twenty miles west of Lambinna Soakage; Moorilyanna Native Well. [Often met with along watercourses and around waterholes; growing to the height of 5 or 6 feet at times.]

*Diplachne loliiformis*, F. v. M. Glen Ferdinand. Stunted specimens under 10 cm. high. *Pappophorum nigricans*, R. Br. Moorilyanna Native Well: Musgrave Ranges and 10 miles east thereof. [A common grass, west of Wantapella Swamp; stock seem to like this grass when it is young.] *P. avenaceum*, Lindl. Wantapella Swamp. [Not a common grass; only found in this one locality.] *Anthistiria ciliata*, L. "Kangaroo Grass." Musgrave and Everard Ranges. [No doubt owing to the long drought, this grass was very stunted; in places and where the rain had fallen it was 2 to 3 feet high; sometimes found on very stony ground.] *Aristida arenaria*, Gaud. Moorilyanna Native Well.

***Triodia aristata***, *sp. n.* (tab. lxx.). *Gramen caespitosum glabrum rigidum, foliorum laminâ involutâ pungente, vaginâ subturgidâ striatâ, ligulâ in circulo brevissimo pilorum conversâ, paniculâ angustâ, glumis vacuis 12-13 mm. longis carinatis 3-5-nerviis longe acuminatis, spiculis compressis 5-6-floris, glumâ floriferâ 9 mm. longâ bifidâ et inter lobos acutos aristam 2-3 mm. longam gerente deorsum 9-nerviâ, nervis ternatim congregatis villosis.* "Porcupine Grass." Nearest to *T. irritans*, R. Br., but differs in the longer, almost awned outer glumes and in the acute lobes of the flowering glume with the midnerve excurrent in an awn which is twice as long as the lobes. An exactly similar specimen is in the Tate Herbarium, placed under *Schedonorus littoralis*, Beauv., to which it bears considerable resemblance, especially as this *Triodia*, at least when dried, is straw-coloured. Tate's specimen is unlabelled, but a loose label in the folio is marked "Mt. Aroona, 30/8/83." This place is near the eastern shore of Lake Torrens, and very probably the specimen was gathered there. [Grew in very large bushes on the sandy flats between the ranges.]

*Eragrostis eriopoda*, Benth. Everard Range and surrounding country. [A very common grass all over the granite country; too hard and wiry to be of much good.] *E. falcata*, Gaud. Forty miles west of Oodnadatta. A starved specimen with panicle only 15 mm. long. *E. chaetophylla*, Steud. Tietkens' Birthday Creek. [Seems to be a common grass in the Musgrave Ranges.] *E. Brownii*, Nees. Wantapella Swamp. Spikelets 10-25 mm. long, flowers 20 to over 50. [This pretty little grass was seen growing on the hard soil near claypans.] *E. pilosa*, Beauv. Flat Rock Hole and Moorilyanna Well. [Only saw this plant growing in one locality on a large claypan, which must be a small lake after rain.] *E. lacunaria*, F. v. M. Moorilyanna Native Well. [A common grass amongst the granite rocks; a good fodder grass.] *Stipa scabra*, Lindl. Musgrave Ranges. Leafblades

very rough with short, stiff hairs. [This grass is not plentiful anywhere; we saw more of it in the Musgrave Ranges than anywhere else; stock seem to relish it.] *Bromus arenarius*, Labill. Everard Range. [This good fodder grass was not met with in any quantity, and only seen in the Everard Range.]

CYPERACEAE.—*Cyperus fulvus*, R. Br. Mount Illbillie and elsewhere in Everard Range; Moorilyanna Native Well. [A common plant in watercourses and low ground.] *C. exaltatus*, Retz. Neales Creek. Some of the primary rays 16 cm. long. [Great masses found near waterholes which hold for some time; attains the height of 6 feet.] *C. rotundus*, L. var. *pallidus*, Benth. "Nut Grass." Twenty miles west of Lambinna Well; Coongra Creek. [Found in very dry watercourses.] *C. difformis*, L. Neales Creek. [Only observed in the Neales Creek; it was growing on flooded ground, and attained the height of 12 to 24 inches.]

JUNCACEAE.—*Xerotes leucocephala*, R. Br. Lambinna Soakage. [Only met with at Lambinna Soakage, in the sandy bed of the Alberga.]

LILIACEAE.—There is a small liliaceous plant from Lambinna Soakage, in bud only. Leaves narrow-linear; perianth-segments narrow, 3-5-nerved; anthers much longer than filaments; style undivided; 2 ovules in each cell of ovary. Perhaps a new species of *Chlorophyton*.

URTICACEAE.—*Ficus platypoda*, Cunn. "Native Fig." Everard Range; Moorilyanna Native Well. [First seen at Indulkana Springs. Never seen more than a few yards away from rocks. In the Everard Range the trees grew to great size; some were from 10 to 13 yards across and 12 feet high, branches resting on the ground. Natives eat the fruit.] *Parietaria debilis*, Forst. Moorilyanna Native Well. [A soft bright-green plant, very delicate; growing in the deep cracks between the granite boulders.]

PROTEACEAE.—*Grevillea nematophylla*, F. v. M. Forty miles west of Oodnadatta. *Hakea lorea*, R. Br. "Corkbark Tree." Sandy country west of the Everard Range. Capt. White's specimens are in flower and are dated 6/8/14. In November of the same year I received from Miss Staer specimens gathered at some point west of Oodnadatta and showing ripe and half-ripe fruits. As supplementary to Bentham's description (Fl. Aust., v., 496) and Bailey's (Queensl. Fl., 1346) it may be noted that the ovary in the flower is almost glabrous, but the young fruit, which is subconical in shape with an incurved point, is hoary with a very fine, close tomentum. This wears off later, and the ripe capsule is lanceolate-ovoid, subcompressed, 30-45 mm. long by 17-20 mm.



broad, more or less curved at the apex and sometimes shortly beaked. The leaves are all simple and vary from 25-45 cm. in length, are at first pubescent but become glabrous with age. The bark is corky. [A common tree throughout the country, and known as the "Cork Tree" owing to the cork-like bark. The natives north of Oodnadatta make shields from the wood on account of it being very light and soft. This tree is very twisted in shape, and the fruits are clustered in great bunches. The flowers contain much honey, for which the ants climb up the trunk in millions; it also affords food to honey-eating birds.]

LORANTHACEAE.—*Loranthus pendulus*, Sieb. Officer Creek, west of Everard Range. [Quantities of this parasitical plant were found growing upon the mulga.] *L. Quandang*, Lindl. Moorilyanna Native Well. [This species was not nearly so plentiful as the others.] *L. linearifolius*, Hook. Moorilyanna Native Well. [This was the only locality where I saw this small species; it was growing on the mulga (*Acacia aneura*).] *L. exocarpi*, Behr. Twenty and 40 miles west of Oodnadatta; 15 miles west of Indulkana Springs. [Numbers of large bunches were found on the mulga trees.]

SANTALACEAE.—*Santalum lanceolatum*, R. Br. Oodnadatta. [A pretty shrub bearing a quantity of dark berries; grows on flooded ground.] *Fusanus acuminatus*, R. Br. "Quondong." Leaves thick, with prominent lateral nerves. [Very few of these shrubs were seen during the trip; owing to the drought, most of them had not fruited for years.]

CHENOPODIACEAE.—*Chenopodium nitrareaceum*, F. v. M. Wantapella Swamp. Seed horizontal, as shown on pl. 28 of Mueller's "Iconography of Australian Salsolaceous Plants," although it is described as vertical in all the diagnoses which I have seen. [Large bunches, round in shape, up to 8 or 10 feet high, growing all over the depression known as Wantapella Swamp; it seems to be eaten by stock.] *Ch. cristatum*, F. v. M. Mount Illbillie. Dwarf specimens with procumbent stems not more than 2 cm. long. *Ch. microphyllum*, F. v. M. Musgrave Ranges. Leaves larger than usual (5-10 mm. long); seed black, shining; in the only flower in which I found stamens there were five of them. [Only met with in Glen Fedinand.] *Kochia sedifolia*, F. v. M. "Bluebush." Ninety miles west of Todmorden Station; between Moorilyanna Native Well and Everard Range. Differs from the type in having the white hairs of the tomentum stellate instead of simple or forked. A similar specimen has been sent me from Mount Gunson by Mrs. Beckwith. In Captain White's specimens the connivent lobes are often raised above the rather narrow wing so that the summit of the fruiting

perianth is convex, showing an approach towards *K. pyramidata*. I would suggest calling this var. *stellulata*. *K. villosa*, Lindl. "Cotton Bush." Moorilyanna Native Well; Flat Rock Hole, Musgrave Ranges; Wantapella Swamp; Lambinna Soakage. [Found in patches all through the country, but very little west of Indulkana Springs. Good fodder for all stock.] *K. decaptera*, F. v. M. Moorilyanna Native Well. [Not a common plant in this locality; a few bunches growing at the foot of the granite rocks.] *K. aphylla*, R. Br. Thirty-five miles west of Moorilyanna Native Well. *K. eriantha*, F. v. M. Indulkana Springs and 15 miles west thereof. There are some puzzling points about these specimens and about similar ones received from Arkaringa through Miss Staer. All the flowers I have examined are female; even in the youngest I could find no sign of stamens. The fruit is obliquely placed within the perianth and the radicle is always descending. The horizontal wing of the perianth has 5 broad lobes, hidden (as are also the 5 short lobes covering the fruit) among the dense wool. Similar specimens collected by Helms in 1891 at Arkaringa are in the Tate Herbarium labelled "*Bassia Dallachyana* = *Kochia eriantha*." [A common plant about Indulkana Springs, but is not found far west from that point.] *Atriplex vesicaria*, Hew. "Bladder Saltbush." Forty miles west of Oodnadatta; Indulkana Springs; Lambinna Soakage; Moorilyanna Waterhole. [A common plant; many fine plains are covered with this good fodder.] *A. nummularia*, Lindl. Indulkana Springs. [Very large bushes of this plant were often seen in the ranges.] *A. spongiosa*, F. v. M. Fifty miles west of Oodnadatta, and at Oodnadatta. [This plant does not extend very far west of Oodnadatta.] *Rhagodia spinescens*, R. Br. Fifty miles west of Oodnadatta. *Rh. nutans*, R. Br. Everard Range; Moorilyanna Native Well. [Not often found; generally growing up in the shelter of some other plant, and made conspicuous by its bright red berries.] *Bassia quinquecupis*, F. v. M., var. *villosa*, Benth. Wantapella Swamp. *B. Birchii*, F. v. M. Glen Ferdinand. Agrees with specimens in the Tate Herbarium of *B. Cornishiana*, F. v. M., which was afterwards reduced to a variety of *B. Birchii*. The fruiting perianth, however, resembles rather that of *B. echinopsila* in the illustrations of Mueller's "Salsolaceous Plants" than that given for *B. Birchii*. The 2 shorter spines of the 5 are united towards their base, and the summit and tube of the perianth are sharply ridged between them. [A quantity of this bush was growing in the glen.] *B. longicupis*, F. v. M. Fifty miles west of Oodnadatta. Fruiting perianth broad and gibbous at base, 2-lobed

on the anterior side where it sits on the branch; spines 4-5, the longest two often 25 mm. long. [A common bush on the stony tablelands; much relished by camels.] *B. paradoxa*, F. v. M. Everard and Musgrave Ranges. [Plentiful; the sharp-spined fruits gave much trouble to man and beast.] *Salsola Kali*, L., var. *strobilifera*, Benth. Twenty miles west of Oodnadatta; Moorilyanna Native Well. [Found throughout the country; much relished by camels.] *Enchylaena tomentosa*, R. Br. Wantapella Swamp. [Growing on ground subject to floods.]

AMARANTACEAE.—*Amarantus Mitchellii*, Benth. Indulkana Springs. *Alternanthera triandra*, Lam. Moorilyanna Native Well. [Found growing amongst the granite rocks.] *Trichinium incanum*, R. Br. Mount Illbillie. I do not see how it is possible, at least in dealing with South Australian and Central Australian specimens, to keep *T. incanum*, R. Br., and *T. obovatum*, Gaud., separate, and Brown's name is, of course, the prior one. The distinctions laid down by Bentham (Fl. Aust., v., 218 and 221) do not hold good in the specimens I have seen. The bracts are never really glabrous, but are always woolly at base and beset with very short glandular hairs in the upper part or they are woolly all over. Where they are most glabrous in appearance the flower-spikes are often cylindrical and 25 mm. long, while on globular spikes the bracts may be densely woolly. The hairs (except the minute glandular ones) are stellately branched; that is to say, the barbs are arranged in several whorls around the axis of the hair, and are much shorter on the hairs of the bracts and bracteoles than on those of the leaves and branches. The hairs themselves vary much in length. Bentham makes "bracts glabrous or nearly so" one of the leading characters of *T. obovatum*, but Gaudichaud himself says "*bracteis pilosiusculis*," and his figure shows them pubescent. Var. *grandiflorum*, Benth. Five miles west of Todmorden Station; Glen Ferdinand. Perianth 12-15 mm. long; bracts and bracteoles straw-coloured, glandular-hairy in the upper part. [Met with on tablelands and also in the sandy valleys of the ranges.] *T. alopecuroideum*, Lindl. Between Moorilyanna Native Well and Everard Range. *T. exaltatum*, Nees. Vaughan Hill, 70 miles west of Todmorden Station; Wantapella Swamp. [This plant was not nearly so plentiful as we found it north of Oodnadatta the previous year (1913).] *T. helipteroides*, F. v. M. Everard Range; Musgrave Ranges; Vaughan Hill. [Quite a quantity of these bright little flowers were seen in the valleys of both ranges; not nearly so plentiful on the tablelands.] *T. corymbosum*, Gaud. East of Everard Range. [It was only in the vicinity of the Everard

Range that this plant was met with, growing in the thick mulga scrub.]

AIZOACEAE.—*Trianthema crystallina*, Vahl. Lambinna Soakage; Wantapella Swamp. [Seen on country subject to flooding.]

PORTULACACEAE.—*Calandrinia ptychosperma*, F. v. M. Glen Ferdinand.

CARYOPHYLLACEAE.—*Polycarpaea corymbosa*, Lam. Coongra Creek. [Only observed this plant in the one locality.]

CRUCIFERAE.—*Stenopetalum lineare*, R. Br. (?) Between Flat Rock Hole and Moorilyanna Native Well. This may be a small hairy form of this species, of which it has the flowers and short pedicels. The leaves are mostly radical, pinnatisect with narrow lobes and more or less tomentose with branched hairs. The specimens are only about 12 cm. high. *S. nutans*, F. v. M. Glen Ferdinand and Moorilyanna Native Well. [Growing in small colonies.] *Blennodia trisecta*, Benth. Ninety miles west of Todmorden Station. Pods more swollen than usual. [Often met with in dry watercourses.] *B. canescens*, R. Br. Near Todmorden Station; Tietkens' Birthday Creek. [Where a shower of rain had fallen a week or so previous to our visit quite a quantity of this plant had sprung up from the sandy soil.]

**Menkea hispidula**, *sp. n.* (tab. lxx.). *Herba annua nana (speciminibus nostris 2-3 cm. altis), omnino pilis patentibus instructa, foliis lineari-oblongis obtusis integris vel paucidentatis radicalibus in petiolum angustatis, petalis luteis sepala patentia triente superantibus, siliculis ovoideo-globosis pubescentibus pedicello paulo brevioribus.* Fifteen miles west of Indulkana Springs. This species differs from all others in its minute size and stiffish spreading hairs. The pods probably resemble those of *M. sphaerocarpa* in shape, but as none are quite ripe and the specimens are in poor condition, it is impossible to say to what extent they may be compressed or globular. Two similar specimens are in the Tate Herbarium labelled "*Capsella cochlearina*, var. *ochrantha*, from the Upper Arkaringa, Helms, 20/5/91." They certainly do not belong to *Capsella*, as the ovary has no septum and contains over 60 ovules. One of our specimens (gathered July 12, 1914) has a ripening capsule with the numerous seeds arranged as in *Menkea*. Apart from the number of seeds, these specimens bear a considerable resemblance to the description of *Capsella villosula*, also collected by Helms on the Arkaringa Creek and described as a new species by Mueller and Tate, but of which the Tate Herbarium contains no specimen. In the report of the Elder Expedition (Trans. Roy. Soc., S.A., xvi., 335) both *C. cochlearina*, var.

*ochrantha*, and *C. villosula* are mentioned. *Lepidium rotundum*, DC. Everard Range. [Found all over the country, varying much in size according to the rainfall.] *L. phlebopetalum*, F. v. M. Fifty miles west of Oodnadatta. *L. papillosum*, F. v. M. Glen Ferdinand. [Quite common in the Glen, but did not observe it elsewhere.]

PITTOSPORACEAE. — *Pittosporum phillyræoides*, DC. Everard Range; Wantapella Swamp; and 20 miles east of Musgrave Ranges. There is also a specimen from the Everard Range with leaves much smaller and appressed-hairy below, the pedicels and branchlets hoary and the flowers mostly terminal. There is no fruit. This is perhaps the variety from the Upper Arkaringa Valley referred to by Mueller and Tate (Trans. Roy. Soc., S.A., xvi., 336), but the leaves of Capt. White's specimen are acute and hooked, as in the type. [Not a common shrub; generally found near granite outcrops or in the ranges. They were nearly all in fruit at the time of our visit, and never attaining more than 10 or 12 feet.]

LEGUMINOSAE.—*Indigofera brevidens*, Benth. Moorilyanna Native Well. [A common plant, growing in some instances into a large bush.] *Psoralea patens*, Lindl. Glen Ferdinand. [Fine bushes, up to 5 feet in full bloom.] *Crotalaria dissitiflora*, Benth. Mount Carneena. [Generally found growing in the loose sand of the dry watercourses.] *Clianthus Dampieri*, Cunn. "Sturt Pea." Between Everard Range and Wantapella Swamp. [The country as a whole was far too dry for this beautiful plant, but where a thunderstorm had passed in one or two places we observed great masses in full bloom.] *Swainsona canescens*, F. v. M. Glen Ferdinand. *S. oligophylla*, F. v. M. Wantapella Swamp. [Only seen once or twice; this is owing to the drought most likely.] *S. microphylla*, A. Gray. Tietkens' Birthday Creek. *S. lessertiifolia*, DC. Glen Ferdinand and Moorilyanna Native Well. Villous specimens; long white hairs mixed with the black ones of the calyx. [This pleasing little plant was very plentiful where a shower or two of rain had fallen.] *Glycine sericea*, Benth. Moorilyanna Native Well. [Found creeping over the rocks and bushes.] *Trigonella suavissima*, Lindl. Wantapella Swamp. [Only met with in the one locality.] *Cassia Sturtii*, R. Br. Ten miles west of Moorilyanna Native Well. [A great quantity of this pretty shrub was met with east of the Musgrave Ranges.] *C. artemisioides*, Gaud. Everard Range and Flat Rock Hole. [Many of these bright-flowering shrubs were met with, and brightened the sombre bushland.] *C. Sophera*, L. Moorilyanna Native Well. [A great many large bushes were growing round the Native Well; most of the leaves had fallen, and only the

seedpods remained.] *Acacia cibaria*, F. v. M. Officer Creek, Indulkana Springs, and Everard Range. In flower only; phyllodia 9-13 cm. long. [Not nearly so plentiful as the common mulga (*A. aneura*).] *A. doratoxylon*, Cunn. Moorilyanna Native Well. Rhachis of flower-spike golden-pubescent. [Large bushes up to 15 feet high grew under the sheltered south side of the huge granite boulders; in full blossom.] There are also specimens of a species near *A. cyperophylla*, F. v. M., gathered in the Musgrave Ranges, but the phyllodes are more slender and the branches lack the reddish tinge of the "Red Mulga." There are neither flower nor fruits. *A. strongylophylla*, F. v. M. Everard Range. [This beautiful shrub was only met with in the Everard Range, from 3 to 8 feet high; they were shapely bushes, covered in golden blossom.] *A. tetragonophylla*, F. v. M. Thirty miles west of Oodnadatta and 20 miles east of Musgrave Ranges. [Although generally dispersed, it is not a common shrub.] *A. salicina*, Lindl. "Native Willow." Oodnadatta. [Fine trees of this beautiful drooping species were met with all through the country.] *A. aneura*, F. v. M. (?) Flat Rock Hole. In leaf only and the phyllodia unusually narrow (scarcely exceeding 1 mm. in breadth). "Round-leaved Mulga" is the local name. [I am firmly of the opinion that this is a distinct form from the common mulga. The two are often intermingled, but many isolated colonies of the round-leaved form were met with. I am sure there are three, if not four species of mulga in the north-west country, but unfortunately hardly any were bearing flowers or pods.]

GERANIACEAE.—*Erodium cygnorum*, Nees. Glen Ferdinand and 15 miles west of Indulkana Springs. [Owing to the dryness of the country very little "geranium" was seen; in some places much dried and blackened remains of this plant indicated a thunder-burst some time before.]

ZYGOPHYLLACEAE.—*Zygophyllum iodocarpum*, F. v. M. Glen Ferdinand. [Only met with this plant once in the Musgrave Ranges.] *Z. fruticosum*, DC. East of Everard Range. Petals only 4 mm. long, fading from yellow to white. [Not a common plant; growing on the sandy soil.] *Z. apiculatum*, F. v. M. Indulkana Springs. *Tribulus terrestris*, L. Glen Ferdinand.

RUTACEAE.—*Eriostemon linearis*, Cunn. Between Moorilyanna Native Well and Everard Range. [Only met with the once; a good-sized bush, covered in blossoms.]

EUPHORBIACEAE.—*Euphorbia Drummondii*, Boiss. Fifteen miles west of Indulkana Springs; 40 miles west of Oodnadatta and Glen Ferdinand. [Grows very close to the ground;

very conspicuous on account of its bright-red colour; supposed to be poisonous and to kill stock.] *E. eremophila*, Cunn. Moorilyanna Waterhole.

SAPINDACEAE.—*Dodonaea microzyga*, F. v. M. Indulkana Springs. [Only seen in this locality; growing amongst the rocks.] *D. viscosa*, L. Mount Illbillie; Indulkana Springs; Glen Ferdinand and between Moorilyanna Native Well and Everard Range. Foliage and fruits very sticky; style 10-12 mm. long and persistent on many of the fruits, even when half-ripe. [A very marked feature of the vegetation growing amongst the granite rocks. Some of the bushes were very wide-spreading, the leaves were of a bright-green with a varnish-like coating, which made them glisten in the sun.]

MALVACEAE.—*Malvastrum spicatum*, A. Gray. Ninety miles west of Todmorden Station. *Sida petrophila*, F. v. M. Moorilyanna Native Well. *Hibiscus Pinonianus*, Gaud. Everard Range. Only the upper leaves are present, and these are tripartite, as are those of some specimens from Barrow Range, Western Australia, in the Tate Herbarium. *H. Farragei*, F. v. M. Mount Illbillie. In fruit only; the seeds glabrous and slightly wrinkled. [A few large plants were growing amongst the tobacco plants close to the granite rocks.] *Abutilon tubulosum*, Hook. Everard Range. [Rather a striking plant, with large yellow flowers; only found growing in the ranges, and not common.]

STERCULIACEAE.—*Ruelingia magniflora*, F. v. M. Mount Illbillie and Everard Range. [This is a most beautiful plant, growing in great masses up to 4 feet high, and covered in dark-red blossoms; plentiful in the Everard Range, growing on the shaded (south) sides of the great masses of granite.]

DILLENIACEAE.—*Hibbertia glaberrima*, F. v. M. Mount Illbillie and other parts of the Everard Range. Our specimens agree with those similarly named from the Everard Range (Helms) and Mount Olga (Giles) in the Tate Herbarium, but in the flowers examined I only found 90-130 stamens and no staminodia. The leaves are 5-12 cm. long, and therefore much longer than in the descriptions of either Mueller or Bentham.

FRANKENIACEAE.—*Frankenia pauciflora*, DC. Between Everard Range and Wantapella Swamp. [Not a common plant; generally found on the stony sides of hills or on the tablelands.] Var. *serpyllifolia*, Benth. East of Everard Range. [Only met with in one place.]

MYRTACEAE.—*Thryptomene Maisonneuvii*, F. v. M. Sand ridges on Officer Creek. [This beautiful little shrub was in full blossom; it seems confined to the sandhill country.]

*Melaleuca glomerata*, F. v. M. Glen Ferdinand and near Mount Illbillie. [This plant was found on nearly all the dry creeks in the ranges; in some places it was very thick.] *M. Preissiana*, Schau. Glen Ferdinand. No flowers, and fruits smaller than usual. [The creek at the top end of the Glen was lined with the shrub.] *Eucalyptus oleosa*, F. v. M. Between Moorilyanna Native Well and Musgrave Ranges; 20 miles east of Everard Range; near Mount Illbillie. A broad-leaved form, in fruit only. [A small colony of about half a dozen trees resembling mallee in growth was met with in a small depression in the country, the rough reddish-brown bark extending some distance up the main branches. These trees had such broad leaves that I took it to be a distinct variety from those met with in the Everard Range.] *E. pachyphylla*, F. v. M. Near Mount Illbillie. In fruit only. [Only observed in the one locality; a few rather stunted trees growing between the ranges.] *E. terminalis*, F. v. M. "Bloodwood." Everard Range. Ripe fruits urn-shaped, 25-28 mm. long. [This is a common species in the ranges, but I have not met with it any great distance from them on the open country.] *E. rostrata*, Schlecht. "Red Gum." Between Indulkana Springs and Moorilyanna Native Well. [Every watercourse throughout the country was lined more or less by these trees. Although there were some good healthy specimens in many places, they did not attain the size of those growing on the watercourses towards the MacDonnell Ranges.]

HALORAGIDACEAE.—*Haloragis odontocarpa*, F. v. M. Officer Creek. [Growing in the sandy bed of the creek.]

UMBELLIFERAE.—*Didiscus glaucifolius*, F. v. M. Indulkana Creek and 20 miles west of Lambinna Soakage. [Great masses of this plant were met with in full blossom in the sandy watercourses.] *Hydrocotyle callicarpa*, Bunge. Everard Range.

ASCLEPIADACEAE. — *Sarcostemma australe*, R. Br. Vaughan Hill. [This strange plant seems to be confined to the stony tablelands and rocky ridges.]

OLEACEAE.—*Jasminum lineare*, R. Br. Everard Range and Glen Ferdinand. [This plant is of creeping habits, and was often seen twining amongst the mulga and other shrubs in the ranges.]

CONVOLVULACEAE. — *Convolvulus erubescens*, Sims. Wantapella Swamp. [Often met with both in the ranges and on the plains.]

BORAGINACEAE.—*Trichodesma zeylaicum*, R. Br. Mount Illbillie. [Growing in masses close up to the rocks, with a southern aspect. The clusters of blue flowers were very effective.] *Heliotropium asperinum*, R. Br. Musgrave



Ranges and 20 miles west of Lambinna Soakage. [Quite large bushes were found in the dry sandy beds of watercourses; the flowers had a beautiful scent like the cultivated species.]

VERBENACEAE. — *Verbena officinalis*, L. Wantapella Swamp. Carpels reddish-brown, with 4-5 longitudinal ridges on the back.

LABIATAE.—*Mentha australis*, R. Br. Neales Creek. *Teucrium racemosum*, R. Br. Forty miles west of Oodnadatta.

SOLANACEAE.—*Solanum ellipticum*, R. Br. Fifty miles west of Oodnadatta; Glen Ferdinand. [Not a common plant; met with in two localities.] *S. Sturtianum*, F. v. M. Vaughan Hill. [Only met with in the one locality.] *S. petrophilium*, F. v. M. Mount Illbillie. [This was a common plant in the Everard Range, growing low down amongst the rocks.] *Datura Leichhardtii*, F. v. M. Mount Illbillie. *Nicotiana suaveolens*, Lehm. "Native Tobacco." Glen Ferdinand and 20 miles west of Lambinna Soakage. [A common plant, growing near or in all the ranges, occasionally found in the thick mulga or along watercourses; natives do not seem to make any use of this plant.]

***Nicotiana suaveolens***, Lehm., var. n. **excelsior** (tab. lxx.). *Varietate a formâ typicâ altitudine majore (1-2 m.), epidermide fere glabrâ, foliis magnis in alas longas decurrentibus, calyce 25 mm. longo pilis glandulosis consperso, lobis linearisubulatis ciliatis, corollâ 5-6 cm. longâ, capsulâ vix tubum calycis aequante, seminibus magnis foveolatis.* "Giant Tobacco." Mount Carmeena, Everard Range. Mentioned by R. Helms in the report of the Elder Expedition (Trans. Roy. Soc., S.A., xvi., 248, 293, 317, and 320). He says the plant was called (in 1891) "okiri" by the Everard Range tribe and "pulanda" by the Blyth Range tribe, but Capt. White found that the natives of the Everard Range now call it "kâman," and Mount Carmeena was named after the tobacco. Specimens collected by Helms, and similar to ours, are placed in the Tate Herbarium under *N. suaveolens*, and the plant is listed in Mueller and Tate's report without any reference to its structural peculiarities, but it seems to me to constitute at least a well-marked variety of this polymorphous species. It is noteworthy that ordinary specimens of *N. suaveolens* brought from drier parts of the same region and mentioned above do not approximate to var. *excelsior* at all. They are short (not over 30 cm. high), small-flowered, and with very hairy stems and pedicels. [There is not the slightest doubt that this plant is a distinct variety of *N. suaveolens*. I collected specimens of the latter not far from where the giant variety was growing. The natives roll the

leaves of this plant into a round ball and hold it between the lips, twisting and turning it round by means of the tongue. Natives value the plant much, and when the camels approached it became very excited and pulled up the plants and placed them up on the rocks out of reach of the dreaded animals.]

SCROPHULARIACEAE.—*Peplidium Muelleri*, Benth. Fifty miles west of Oodnadatta, July 1. Mostly in fruit, with a few flowers. The capsules are ovoid but obtuse, not acute as described in Fl. Aust., iv., 500, and in Tate's Handbook, 153. When ripe they open in 4 valves from the the base. Moorilyanna Native Well, July 7. In flower only. [Plentiful in some localities, growing round claypans.]

BIGNONIACEAE.—*Tecoma Oxleyi*, Cunn. Glen Ferdinand; granite rocks near Moorilyanna Native Well. Usually placed under *T. australis*, R. Br., but seems to be specifically distinguished by larger flowers (calyx 4-5 mm. long, corolla 25 mm. long, longitudinally red-streaked inside), leaflets narrow and more numerous (7-9) and without any gloss on the upper face. *T. Oxleyi* is a desert plant growing in country with an average rainfall of 5 to 10 inches, while *T. australis* grows in the eastern coastal lands with a rainfall of 30 to 60 inches. [This is certainly not *T. australis*, for this plant grows in the most arid situations and does not take the habit of that species. The great bunches of flowers are very many times larger than those of *T. australis*. Although it is often stated that the natives make their spear-shafts from this plant, I did not see any shoots fit for this purpose, nor did I see one instance where the natives had cut any branches for that purpose.]

ACANTHACEAE.—*Justicia procumbens*, L. Glen Ferdinand. [Low bush, 10 or 12 inches high; not a common plant.]

MYOPORACEAE.—*Myoporum deserti*, Cunn. Everard Range. [Not a common tree; a few were met with in the ranges attaining the height of 10 to 15 feet, and were in fruit at the time of our visit.] *Eremophila latifolia*, F. v. M. Moorilyanna Native Well. Young leaves and calyx very sticky or glossy; leaves narrow and almost entire in our specimens, which are in flower only (collected July 13). [A number of large bushes of a very bright-green were growing on the sheltered sides of the rocks.] *E. neglecta*, J. M. Black. Indulkana Springs and 15 miles west thereof. Since describing this species (Trans. Roy. Soc., S.A., xxxviii., 469) I have seen the drawings of *E. viscida*, a Western Australian species, in Mueller's "Myoporincus Plants of Australia," and

was struck by the resemblance to *E. neglecta* in several respects. Professor Ewart kindly compared the latter with specimens of *E. viscida* in the National Herbarium of Victoria, and writes:—"The specimen of *E. neglecta* seems to come very close to, if not to be the same thing as *E. viscida*, Endl. For complete certainty, however, a fruiting specimen would be necessary in order to see if the characteristic enlargement of the calyx-lobes takes place." Later he wrote:—"The Elder Expedition specimen named *E. Duttonii* in our herbarium seems to me to belong to *E. viscida*, and shows the characteristic enlargement of the calyx-lobes." It should be observed, however, that the ovary of *E. viscida* is described by Endlicher as villous, and is so depicted in Mueller's plate (which is said to be drawn from one of Endlicher's specimens out of the Botanic Museum of Vienna), while the ovary of *E. neglecta* is glabrous and shining. The specimen from Indulkana Springs shows that the corolla may attain a length of 30 mm. *E. viscida* is mentioned in Mueller and Tate's report of Tietkens' expedition into Central Australia, 1889 (Trans. Roy. Soc., S.A., xiii., 105) as having been gathered between Mount Connor and Basedow Range. None of Tietkens' specimens are in the Tate Herbarium; they are probably in Melbourne, and I do not know whether Professor Ewart refers to them in his above remarks, or to specimens of *E. viscida* obtained from Western Australia, where the type was gathered by Roe. It is quite possible that Tietkens' Central Australian plant is *E. neglecta* rather than *E. viscida*. Since writing the above I have received the following reply from the Director of the Royal Botanic Gardens, Kew, to whom a specimen of *E. neglecta* was sent:—"There are no specimens of *Eremophila viscida*, Endl., at Kew, but judging from Endlicher's original description, from that given by Bentham in his 'Flora Australiensis,' and from the figure published by F. von Mueller, it is not the species now described and figured as *E. neglecta*. In particular the glabrous ovary and style of *E. neglecta* and the shape of the anterior corolla-lobe are sufficient to distinguish the species from *E. viscida*, Endl. The specimen of *E. neglecta* has not been matched with any specimen preserved in the Kew Herbarium." [Found as far west as the Musgrave Ranges.] *E. Latrobei*, F. v. M. Musgrave Ranges. At Lambinna Soakage and 15 miles west of Indulkana Springs were also gathered specimens of the hoary variety first described by Mueller and Tate as *E. Tietkensii*, but afterwards recognized as a "broad-leaved, canescent variety" of *E. Latrobei*. [Often found growing amongst the rocks on the sides of the ranges, and sometimes attaining the height of 10 or 12 feet.] *E. Gilesii*,

F. v. M. Flat Rock Hole east of Musgrave Ranges. [Not nearly so robust a shrub as other members of the genus, and it seems to prefer the sandy soil.] *E. Freelingii*, F. v. M. Twenty miles west of Oodnadatta; Moorilyanna Native Well and between that spot and the Everard Range. [Grows into a very compact bush, in small colonies generally, on stony ground.] *E. longifolia*, F. v. M. Everard Range and Moorilyanna Native Well. [This plant has quite a drooping habit; it grows much more slender and higher than the other species.] *E. Brownii*, F. v. M. Twenty miles west of Oodnadatta and Wantapella Swamp. [This species seems to prefer low localities subject to flooding; the bush is large and rigid.] *E. Paisleyi*, F. v. M. East of Everard Range. The calyx segments are broader than those of the Central Australian specimens, spatulate in shape, slightly overlapping in the upper part, and strongly ciliate; pedicels in 2's and 3's. [Not so robust as many other members of the same genus.] *E. Willsii*, F. v. M. Glen Ferdinand. Leaves 3-4 cm. long. *Pholidia scoparia*, R. Br. Wantapella Swamp. [Only seen in one locality; the stock seem to eat this bush.]

RUBIACEAE.—*Pomax umbellata*, Soland. Mount Illbillie. [Not a common shrub; growing high up in the rocks.]

CUCURBITACEAE. — *Melothria maderaspatana*, Cogn. Mount Carmeena and Coongra Creek. [Often met with creeping over shrubs or rocks; where water had lately flowed the plant was covered in bright-red berries.]

CAMPANULACEAE.—*Wahlenbergia gracilis*, DC. Indulkana Springs. *Isotoma petraea*, F. v. M. Mount Carmeena and Officer Creek.

GOODENIACEAE.—*Goodenia glauca*, F. v. M., var. *sericea*, Benth. Fifty miles west of Oodnadatta. *G. cycloptera*, R. Br. Officer Creek. *Velleia paradoxa*, R. Br. East of Everard Range. *Brunonia australis*, Smith. "Native Pincushion." Bed of Officer Creek and Lambinna Soakage. Luxuriant specimens with very silky leaves. [Not often seen; in both instances it was growing in dry watercourses. Very attractive with its cornflower-blue.] *Scaevola humilis*, R. Br. Glen Ferdinand.

COMPOSITAE. — *Olearia Ferresii*, F. v. M. Everard Range. Viscid and strong-scented even in the dried state. *O. megalodonta*, F. v. M. Everard and Musgrave Ranges. This stiff shrub, with its ray-flowers in 2 rows and its compressed achenes, is very near the genus *Felicia*. The heads vary somewhat in size, the ray-flowers number 35-50, and the inner flowers about 70. I could find no short outer bristles of the pappus. [Flowers bright-blue.]

**Pterigeron cylindriceps**, *sp. n.* (tab. lxi.). *Herba erecta, pilis glandulosis conspersa, foliis obovatis vel oblongis in petiolum brevem angustatis crenato-dentatis 6-10 mm. longis, involuero ante floritionem oblongo-cylindrico circiter 20 mm. longo inter folia floralia sessili, bracteis herbaceis acutis sursum purpurascens interioribus glabris lanceolatis 18 mm. longis, floribus exterioribus filiformibus numerosis brevissime ligulatis (ligulâ vix 1 mm. longâ), interioribus circiter 15, pappi setis barbellulatis, achaeniis tenuibus pubescentibus.* Fifty miles west of Oodnadatta and at Moorilyanna Waterhole. Nearest to *P. adscendens*, but differs in the longer and cylindrical head, the almost glabrous involucre, and the much more numerous flowers in each head. A similar specimen from Mount Parry is placed in the Tate Herbarium under *P. liatroides*.

*P. adscendens*, Benth. Fifty miles west of Oodnadatta. Dwarf specimens 2-5 cm. high. *Minuria leptophylla*, DC. Everard Range and Wantapella Swamp. [A not uncommon flower of a bright-blue colour.] *M. denticulata*, Benth. Moorilyanna Native Well. [Found growing at the foot of the granite rocks and boulders.] *Podocoma nana*, Ewart and White. Glen Ferdinand and Everard Range. The ripe achenes have a beak 5 mm. long; pappus 9 mm. long, consisting of about 15 long unequal bristles and an outer row of several short bristles. Recorded also from Mount Lyndhurst (M. Koch) and Torrens Plain (R. Tate). Professor Ewart kindly confirmed the determination. [A very common plant which varied much in size, no doubt according to the amount of moisture in the locality where it grew. Found on sandy soil, also around claypans.] *Brachycome ciliaris*, Less., var. *glandulosa*, Benth. Glen Ferdinand. I feel some doubt about this determination, the achenes not being quite ripe. The specimens are perennial, the leaves with narrow, distant teeth, and the involucre bracts very blunt, with scarious, purplish, jagged margins. I have a similar specimen from Miss Staer, gathered near Oodnadatta. *Calotis Kempei*, F. v. M. Twenty miles west of Lambinna Soakage; Tietkens' Birthday Creek; also from near Oodnadatta (Miss Staer). Leaves vary from obovate-cuneate to lanceolate. Some of the ripe achenes on one specimen bear a single barbed awn in addition to the inrolled pappus-crown, thus showing a tendency towards *C. dentex*, R. Br. [Not a common plant; only observed once or twice during the trip.] *Calotis latiuscula*, F. v. M. et Tate. Moorilyanna Native Well and 50 miles west of Oodnadatta. [Not a common plant; rarely seen.] *C. cymbacantha*, F. v. M., var. *pumila*, Benth. Glen Ferdinand and claypan between Flat Rock Hole and

Moorilyanna Native Well. [Not common: growing in small colonies.] *Siegesbeckia orientalis*, L. Moorilyanna Native Well. [Growing 8 or 12 inches high in the shelter of the rocks.] *Craspedia chrysantha*, Benth. Fifty miles west of Oodnadatta. *Calocephalus platycephalus*, Benth. Everard Range and east thereof; 20 miles west of Lambana Scakage; Indulkana Creek. *Myriocephalus Stuartii*, Benth. Oodnadatta; Everard Range; and 35 miles west of Moorilyanna Native Well. Some specimens only 6-7 cm. high. [Found all over the country; in some instances in very large masses.] *M. Rudallii*, Benth. Moorilyanna Waterhole. [This was the only locality in which the plant was seen.] *Gnephosis cyathopappa*, Benth. Everard Range. In bud only. *Angianthus pusillus*, Benth.(?) Between Flat Rock Hole and Moorilyanna Native Well. The specimens are dwarf, and the heads so young that only the bracts are recognizable. [Grew in tufts low to the ground, like moss.] *Ixiolaena leptolepis*, Benth. Forty miles west of Oodnadatta; Everard Range; Wantapella Swamp. [This plant was plentiful nearly all over the country, and grew on tablelands and sandy country alike.] *Rutidosis helichrysoides*, DC. Mount Carneena. [This handsome plant was growing along the south side of the range, attaining the height of 2 to 3 feet.]

**Toxanthus Whitei**, *sp. n.* (tab. lxi.). *Herba parva annua albo-lanata 6-10 cm. alta, caulibus gracilibus ascendentibus saepe simplicibus, foliis angusto-linearibus mollibus 5-10 mm. longis, capitulis terminalibus 40-50-floris, involucri bracteis 11-13 linearibus rigidis glanduloso-puberulis scarioso-marginatis 5 mm. longis, corollâ luteâ recurvâ 5-dentatâ, achaenio (immaturo) papilloso rostrato.* Everard Range and claypan between Flat Rock Hole and Moorilyanna Native Well. Clearly distinguished from the two other known species of *Toxanthus* by the more erect growth, the numerous bright-yellow flowers, and the greater number of involucre bracts. Named after the collector, Capt. S. A. White. [Only a few plants were seen, and these seemed to have come up after a very light shower which fell over a restricted area. The stems grow close to the ground until the buds begin to appear, when they curved upwards.] *Podolepis canescens*, Cunn. Everard Range and between Moorilyanna Native Well and the Musgrave Ranges. [Quite a common flower; growing on the sandy soil.] *P. Siemssenia*, F. v. M. Wantapella Swamp; Everard Range; and 20 miles west of Lambinna Soakage. [A common little plant, growing in great masses in the sandy country.] *Schoenia Ayersii*, J. M. Black (*Helichrysum Ayersii*, F. v. M.) Musgrave Ranges

and 10 miles east thereof. If *Schoenia* is maintained as a genus distinct from *Helichrysum* (and this is the course taken by Bentham in the "Flora Australiensis," by Bentham and Hooker in "Genera Plantarum," and by Engler and Prantl in the "Natürliche Pflanzenfamilien"), then *H. Ayersii* must go along with *S. Cassiniana*. Besides the compressed achenes, it has the undivided style of the inner flowers which characterizes the genus *Schoenia*. [Very plentiful throughout the country traversed.] *S. Cassiniana*, Steetz. Mount Carmeena and between Moorilyanna Native Well and Everard Range. [In some localities this bright-flowering plant covered acres of ground amongst the mulga.] *Helichrysum apiculatum*, DC. Glen Ferdinand. [This grows into quite a large bush at times.] *H. podolepidium*, F. v. M. Wantapella Swamp and Officer Creek. The form with white rays to the inner involucre bracts. [Not often seen; compact growth; very attractive, with bright-yellow flowers and almost white leaves.] *H. bracteatum*, Willd. Mount Carmeena. [Not common; some fine plants seen in this locality.] *H. Lawrencella*, F. v. M. Ninety miles west of Todmorden Station; 35 miles west of Moorilyanna Native Well. [A common flower all through the country.] *Helipterum Charsleyae*, F. v. M. Forty miles west of Oodnadatta and Wantapella Swamp. [Found plentifully till granite country was entered; it then disappeared.] *H. floribundum*, DC. Everard Range; Officer Creek. [A very common plant; growing in great masses in many localities; found everywhere.] *H. Fitzgibbonii*, F. v. M. East of Everard Range. [Often met with in the vicinity of the Everard Range; growing closely to the ground.] *H. pterochaetum*, Benth. Indulkana Springs and 15 miles west thereof; Glen Ferdinand. [Found in many places, but not plentiful.] *H. stipitatum*, F. v. M. Between Moorilyanna Native Well and Musgrave Ranges; Everard Range. [Very plentiful in places, turning the sand into a cloth of gold, they grew so thickly.] *H. strictum*, Benth. Fifty miles west of Oodnadatta and 50 miles west of Todmorden Station: Lambinna Soakage. [Plentiful; varies much in size according to the amount of moisture.] *H. Tietkensii*, F. v. M. Between Moorilyanna Native Well and Everard Range; Glen Ferdinand; Indulkana Creek. Only young plants (1/8/14), much resembling *Gnaphalium luteo-album*. [Growing in colonies, with many miles between each colony.] *Waitzia corymbosa*, Wendl. Between Moorilyanna Native Well and Everard Range. [Not a common flower; very striking, with its deep-orange colour amongst the sombre mulga.] *Gnaphalium japonicum*, Thunb. Everard Range. [Great quantities of this plant

grew in places amongst the ranges, giving the landscape a silvery sheen.] *Senecio Gregorii*, F. v. M. Fifty miles west of Oodnadatta; Officer Creek. [This was a common flower all through the country.] *S. magnificus*, F. v. M. Mount Carmeena and Glen Ferdinand. [This plant grew very luxuriantly in some places; at Mount Carmeena it reached 5 feet 6 inches, with large heads of flowers.]

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DESCRIPTION OF PLATES.

PLATE LXIX.

*Toxanthus Whitei*, n. sp. 1, flower. 2, two of the involucrel bracts.

*Pterigeron cylindriceps*, n. sp. 3, style. 4 and 5, outermost and innermost involucrel bracts. 6, outer flower.

PLATE LXX.

*Menkea hispidula*, n. sp. 1, replum and seeds. 2, ovary. 3, flower. 4, petal. 5, stamen.

*Triodia aristata*, n. sp. 6, flowering glume, with that of *T. irritans* for purposes of comparison. 7, spikelet.

*Nicotiana suaveolens*, Lehm., n. var. *excelsior*. 8, calyx and capsule. 9, seed.

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